

**public forestry administrations
in latin america**

**by
j. prats llauradó and g. speidel**

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Summary

In this study, the main features of the Public Forestry Administrations are systematically described and analysed. In the first chapter, the purpose, scope, limitations, methods and sources of the study are presented. The next five chapters review the institutional base of the Public Forestry Administrations; their functions, place in the government organization and internal structure; their manpower situation and training systems; their planning activities and systems, and their financing arrangements; their means of adjustment to change. Of the last two chapters, one deals with approaches to, and methods for, improvements, and the other with a systematic review of main problems and conclusions.

The "Comparative Study of Public Forestry Administrations in Latin America" was prepared by the authors and collaborators mentioned in the preface. A provisional version of the study was submitted for review to the Seminar on Modernisation of Public Administration in the Forestry Sector of Latin America held in Lima, Peru, from 10 to 29 November 1975, and to the 12th Session of the Latin American Forestry Commission held in Havana, Cuba, from 2 to 7 February 1976. The present version has been slightly amended as a result of these reviews. The conclusions and recommendations of the Seminar and the relevant section of the Commission report are given in Annexes III and IV respectively.

The reader will find in Annex II the numbers of pages and tables where each Latin American country is mentioned. The presentation of the material contained in this publication and the terms employed therein do not imply any opinion with regard to either the legal status of a country or territory or its government authorities and boundaries.

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PREFACE

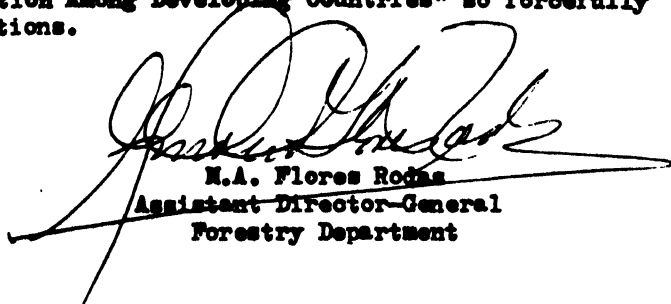
The Spanish original of this Comparative Study of the Public Forestry Administration in Latin America by J. Prats Llauredó and G. Speidel was published in 1975. Similar studies of selected public forestry administrations in Africa, by S.K. Adeyoju, and in the Asia-Pacific Region, by D. Palin, were published in 1976 and 1980 respectively. Because of their broad coverage and comparative approach, these three studies represent together an important and original contribution to the understanding of public forestry administrations in developing countries. This contribution will be complete with a fourth study concerning selected countries in the Near East Region.

The Latin American study, the first and most comprehensive of the series, is now being made available to the readership in English. While certain facts and figures given will inevitably appear obsolete, the basic contents of the study should be as valid and useful today as they were when the work was first published. The study should be of particular interest to the reader in view of the fact that, with a very few exceptions, the public forestry administrations in Latin America were born and grew outside the colonial legacy that has influenced so much the origin and development of other forestry administrations in the majority of African and Asian developing countries. In this connection, the sections of the study dealing with the institutional base of Latin American forestry administrations, their personnel, their place within the government organization, their financing arrangements and their means of adjustment to change should particularly be of interest to the reader.

This English version of the study includes, in Annex III, the conclusions and recommendations of a Seminar on Public Forestry Administration held in Lima (Peru) in 1975, with the provisional text of the study as its main document. Annex IV includes an excerpt from the report of the 12th Session of the Latin American Forestry Commission (1976) with the views and recommendations of the Commission on the subject "Modernization of Public Administration in the Forestry Sector in Latin America". These two annexes represent an invaluable addition to the study in that they reflect the collective wisdom of the directors and senior officials of Latin American forestry administrations with respect to the subjects covered by the study.

Many important trends in the world situation point nowadays towards new tasks for the Public Forestry Administrations and towards new ways of performing these tasks. These trends include the new developmental approaches with their emphasis on improving the destiny of the rural poor; the high cost and scarcity of conventional energy and the rediscovery of forest biomass as an important source of energy; and the world-wide concern over the future of tropical forests and the spread of the deserts with the renewed importance attached to integrating silvicultural, agricultural and pastoral forms of land use.

There is no doubt that developing countries must carefully re-examine the role of their Public Forestry Administrations and the means at their disposal. In many cases this re-examination will lead to unconventional solutions. The Forestry Department of FAO is committed to assisting member countries in this task. I am convinced that one of the best means of assistance is that of disseminating information on approaches and solutions adopted by the developing countries themselves, so that these countries may learn from one another's experiences in the spirit of "Technical Cooperation Among Developing Countries" so forcefully and repeatedly recommended by the United Nations.



M.A. Flores Rodas
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CHAPTER I

SCOPE AND METHOD OF THE STUDY

"Administrative reform is inseparable from the general evolution of society. The public that comes daily into contact with government offices, or is the beneficiary of their work, has not only the right to demand timely and full attention, but is also under an obligation to contribute by its conduct to the proper functioning of institutions."

LUIS ECHEVERRIA ALVAREZ

1. BACKGROUND

That the strengthening of Public Administration is an invaluable means of fostering development has been recognized by the Economic and Social Council of the United Nations. In the assessment of the achievements of the First Development Decade (1961-70), the insufficient administrative capacity of Public Administrations was recognized as one of the principal handicaps, a point which received much attention in preparing a new strategy for the Second Development Decade (1971-80).

This is true generally speaking, but in particular in the case of Forestry Administrations, because the methods of managing public or private forests can have very significant repercussions on society as a whole.

The recent United Nations General Assembly Resolution 3201 (S-VI) on the establishment of a New International Economic Order declares inter alia the principle of "Full permanent sovereignty of every State over its natural resources and all economic activities. In order to safeguard these resources, each State is entitled to exercise effective control over them and their exploitation, with means suitable to its own situation, including the right to nationalization or transfer of ownership to its nationals, this right being an expression of the full permanent sovereignty of the State. No State may be subjected to economic, political or any other type of coercion to prevent the free and full exercise of this inalienable right."

Presumably, governments will be making ever greater efforts to apply this principle, as far as their forest resources are concerned, in view of the growing economic importance of these resources and their contribution to national development; this calls for more effective planning and exercising greater control than hitherto in regard to forest utilization and regeneration. Accordingly, stronger Forestry Administrations, better staffed with technically and administratively trained personnel, will be required. On the other hand, the rapid growth of the rural population in many countries means encroachment upon forest land. In some cases efforts will have to be made to apply sound principles in the transfer of land now under forests to agricultural uses. In other cases, forest resources and industries will have to do more to create employment opportunities and to foster rural development. Many Forestry Administrations must take on new tasks: promotion of rural community development, introduction of agro-silvicultural practices combined with crop farming and stockraising, and cooperative management of forests. Furthermore, the repercussions of forest operations on the environment must be kept in mind. To that end it will be necessary that Forestry Administrations redouble their efforts in environmental and that they cooperate with other institutions and expeditiously apply forestry findings in practical work.

For all these reasons, the need to improve the efficiency of Forestry Administrations is becoming ever more evident in developing countries. In the case of Latin America, as far back as 1962, a basic ECLA/FAO study^{1/} was made setting forth, with order of priority and urgency, a series of measures for the development of forest resources, first and foremost the establishment of a strong national Forestry Department. As mentioned in Chapter III, the Latin American Forestry Commission has also adopted several recommendations along the same lines; particularly significant are those adopted at the 11th Session of that Commission^{2/}. But the significance of this problem is also felt at the national level. One proof of this was the holding of the first national seminar on public administration for professional foresters in October 1973 at Oaxtepec, Mexico. Even more significant instances are the many government applications to obtain UNDP and FAO assistance in the strengthening and modernization of their Forest Services. This modernization is more feasible today than years ago thanks to persistent efforts already made in forestry education and training. In turn, the improvement of Administrations will doubtless open new opportunities for productive employment for recently trained forestry personnel.

We feel that the application in the Public Administration of new knowledge and new methodologies and policies will be all the more rapid the more encouragement is given to their transfer to national circles where forest policies are framed and guidelines laid down for the development of the sector. This calls, of course, for full participation of the interested countries and for their greatest possible share in the experience that is being gained. The present study was carried out with this in mind.

2. PURPOSE, CONTENTS, LIMITATIONS

The purpose of this document is to analyze and describe the present status and trends of Forestry Administrations in Latin American countries and what these countries are doing to improve them. The ongoing UNDP/FAO projects in this region in support of such action have been the main sources of information for this study. That is why it was presented in draft form to the Seminar on Modernization of Public Administration in the Forestry Sector of Latin America (Lima, Peru, 10-29 November 1975), in which all countries having projects of this type participated. (See conclusions and recommendations of this Seminar in Annex III.)

This study was also presented at the 12th Session of the Latin American Forestry Commission (Havana, Cuba, 2-7 February 1976), which endorsed the study (see Annex IV). It is hoped that the present, slightly revised version will be of help to all countries in the region that wish to find and adopt structural and functional innovations to enhance the efficiency of their Forestry Administrations, considered as instruments of the government for promoting development and improving the environment.

In the next five chapters, the following topics will be discussed: (a) the institutional base (forest policy and legislation) of Public Forestry Administrations in Latin America; (b) their functions, place within government, and their internal structure; (c) their power resources and training systems; (d) their planning units and activities, and their financing arrangements; and (e) their means of adjustment to change (information, research, public relations work). Of the last two chapters, one will be devoted to the approach to, and methods for, improvement, and the other to a systematic review of main problems and conclusions.

1/ ECLA/FAO - "Latin American Timber Trends and Prospects". UN, New York, 1962 (E/CN.12/624 and FAO/LAFC 62/5).

2/ Latin American Forestry Commission - "Report of the 11th Session" (Quito, Ecuador, November 1970) and Doc. FO:LAFC/10/7: "Modernization of Institutions for Promoting Forestry Development in Latin America".

Thanks to the invaluable assistance of many colleagues and collaborators, this study is based on a wide range of information. Yet this is neither so complete nor so uniform as not to admit many shortcomings and gaps. We could not visit all countries; although some were visited and others have sent us their national reports, we know that omissions and misinterpretations have occurred. But we alone are to blame for this. Dealing with countries in the region that are neither Spanish- nor Portuguese-speaking presented obvious difficulties due to their different legal, administrative and cultural traditions. It is hoped that these difficulties were at least partly overcome and that the references to these countries will be among the most interesting for the reader.

3. METHOD AND SOURCES

In the broad field of Public Administration there has been in the past quarter of a century a plethora of comparative analyses and publications. There has been much research dedicated to comparative analyses of Public Administrations in relation to the Third World development process. On the other hand, to date, no comparative study seems to have been made in the more restricted field of Public Forestry Administrations. About 20 years ago, FAO published two volumes² containing data on resources, policy, legislation, administration, lumbering and forest industries for about 20 European countries. Although these present much informative material in an orderly fashion, they constitute a mere juxtaposition of data by country with no intent of analysis or comparison.

One important point is that virtually all comparative analyses of Public Administrations have recognized the special features of each administrative system without suggesting that one or another system should be taken as a model, that is to say, is intrinsically better than the other, nor implying that the principles or procedures that have proven good in one country are applicable to another without adaptation.³

The question then arises: Is it worthwhile making comparisons? In fact, the problem of comparability is the perennial, basic one in a study of this kind. In this case it was decided to make comparisons because, first of all, we feel that there are identifiable similarities and differences among Public Forestry Administrations in Latin America that may, as a whole, be generalized. Secondly, we believe that none of these Administrations is unique in all respects, although their originality should not be denied, nor are they unrelated to certain basic principles of administrative behaviour. Thirdly, because many of these have given proof of great dynamism in self-improvement, and a comparison of their efforts towards improvement might accelerate this process. Finally, let it be said, comparison is useful in stimulating a purposeful setting of standards, which, in essence, means seeking or suggesting possible solutions to what may today appear to be the key problem of these Administrations, namely to arrive at the point of providing them with man-power resources, organizational facilities and materials commensurate with their tasks and purposes.

There are precedents as illustrious as they are ancient for comparative analysis in the social sciences. Aristotle composed his "Politics" having to hand a vast amount of information on 158 constitutions of Greek and barbarian States. Instead of writing his treatise by philosophical deduction, he invented comparative constitutional law; he travelled and collected, with the help of his disciples, an enormous mass of data and then observed, compared, systematized, and interpreted.

2/ FAO - "National Forestry Policies in Europe", Rome, 1954.

"Le Monde forestier", Vol. I (Europe et l'URSS), Rome, 1957.

3 - "Conjeturas acerca de la administración pública comparada", in
"_____ción Pública - Ensayos en honor de P.H. Appleby", compiled by
R.C. Martín, Herrero Hermanos, Mexico, 1967.

In short, the working hypotheses have been: (a) that Latin American Public Forestry Administrations have sufficient similarities of background, status and objectives for meaningful comparison; (b) that making such a comparison is useful and pertinent in so far as it shows the relative progress of the various Administrations and may reveal lines of action that may help them adapt better to their stated purposes; and (c) that this comparison can be made starting out from certain general theoretical ideas and arriving at certain models which are not presented as prototypes to be copied, but simply as useful devices for interpreting reality.

For this exercise in comparative analysis the approach has been primarily empirical, with emphasis on the systematic description and analysis of a considerable amount of data and paying special attention to the operational aspects of the Administrations observed. Apart from inevitable conceptual positions at the outset, this method is actually intended to be inductive, certain conclusions having been reached only after an analysis of data, that is to say after a hopefully adequate confrontation with actual facts.

The essential information base consisted of: (a) 16 country reports prepared in response to a standard "National Questionnaire" by the Public Forestry Administrations of the various countries or in close collaboration with them; (b) ex professo visits to 14 countries; (c) abundant information and substantive contributions from 16 UNEP/FAO projects with institutional development components in forestry; and (d) material available in FAO archives, including new information that FAO receives regularly from governments, educational and research institutions, Public Forestry Administrations, experts and individual collaborators.

We believe that the amount of information derived from these reports justified extending the study to 25 countries of Latin America (Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Surinam, Trinidad, Uruguay and Venezuela). However, we must admit that the information forthcoming from certain countries was far less abundant and recent than that from others, which will certainly be reflected in the treatment of these countries in this document.

Without making any claim to exact definitions, but merely in order to avoid confusion, the meanings of certain terms and expressions employed in this study are given in FIGURE 1. Definitions of certain other terms (for instance "forestry sector", "line organisation", "on-the-job training", etc.) that are used less frequently, or that require fuller explanation, are given in the text when they appear for the first time.

1/ We received country reports from: Argentina, Belize, Bolivia, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Jamaica, Mexico, Nicaragua, Paraguay, Peru, Uruguay. The countries visited ex professo were: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Paraguay, Peru and Venezuela. The UNEP/FAO projects from which we received collaboration are actually ongoing (or recent) in conjunction with the governments of Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Mexico, Nicaragua, Panama, Paraguay, Peru, Surinam and Venezuela.

FIGURE 1

GLOSSARY OF TERMS USED FREQUENTLY IN THIS STUDY

POLICY - Government policy-making includes the setting of objectives and providing of implementation instruments in the form of legislation, organizational set-up and material

PUBLIC ADMINISTRATION - The aggregate of activities for implementing government policy and programmes, and usually the administrative body that plans, organizes, directs, coordinates, controls and, at least in part, executes such activities.

PUBLIC FORESTRY ADMINISTRATION (PFA) - The technical and administrative agency of the government to whom specific tasks and powers are assigned in order to attain the goals of forest policy and legislation. In some cases this agency is an autonomous or semi-autonomous government body; in others it is a clearly identifiable branch of centralized national Administrations. In federated countries, the Public Forestry Administrations may include a national agency plus several state or provincial Forest Services.

ENTERPRISE - Either a public or a private agency that permanently performs an economic function (production of goods and/or services) and enjoys considerable autonomy in decision-making.

PUBLIC AGENCY - An agency in which entrepreneurial functions are exercised entirely or to a great extent by public authorities.

CONCENTRATION - Elevation of the hierarchical rank in which authority to exercise a certain type of function or to make certain types of decisions is vested (cf. DECONCENTRATION).

DECONCENTRATION - Generally speaking, this means lowering the hierarchical level in which authority for action or decision-making is vested (cf. DELEGATION OF AUTHORITY). It usually refers to the transfer of functions and activities from the central units of an agency to field offices or units of that agency.

DECENTRALIZATION - Transfer of functions and activities of a national public agency to other agencies, usually "subnational", that is to say either municipal, departmental or regional ("state" or "provincial" in federated countries).

DELEGATION OF AUTHORITY - Giving subordinates the authority to take action or make decisions; delegation differs from deconcentration in that it is only temporary and readily revokable.

TRAINING - Imparting know-how about a task or duty.

FORESTER - A graduate of a university, college or equivalent school having completed a minimum of four years of full-time study, generally in forestry or related fields.

FORESTRY TECHNICIAN - A person who, after a minimum of 9 years of primary and secondary schooling, has taken full-time training courses for at least 2 or 3 years in an accredited sub-university level institution.

VOCATIONALLY TRAINED FORESTRY PERSONNEL - Persons mainly supervising forest workers. Normally they have had at least 6 months of formal training and very often they taken from the labour force (forest guards, foremen).

CHAPTER II

INSTITUTIONAL BASE

1. CONTEXT AND BACKGROUND

1.1 Recent History

The solemn DECLARATION of the Seventh World Forestry Congress recognized that "in many countries declared forest policies are not in accord with new knowledge, new preoccupations and new aspirations" and considered it "urgent to redefine forest policies in view of these new circumstances"^{1/}.

According to FAO^{2/} new circumstances in today's world can be grouped under four headings: (a) population growth; (b) economic development; (c) technological advance, and (d) social, political and institutional changes. Latin America has been participating in the recent evolution, sharing the destiny of the Third World, although with its own special features. Most Latin American countries became independent more than a century ago. Their level of development is, as a whole, higher than that of the rest of the Third World. Of the 25 countries identified by the United Nations as being among the least developed, only one is in this region. Although the rate of population growth is very high, population density is low, except in El Salvador, Haiti, Jamaica and Trinidad. On the other hand, the accelerated process of urbanization and the large amount of road infrastructure-building as well as technological advances have changed the context of forest policy and forestry work in Latin America as much as, or more profoundly than in other regions.

Among these new circumstances, the most decisive have doubtless been of a socio-economic and cultural nature. On the one hand there have been rising individual aspirations, not only in material terms but also in terms of participation and desire for human dignity. On the other hand there is the ever firmer will of nations to achieve complete economic self-determination and to exercise to the full their sovereignty over their own natural resources.

FIGURES 2 and 3 present socio-economic data and baseline data on forests for the 25 countries studied in this document. FIGURE 4 gives information that can illustrate schematically the degree of activity and technological advance in the forestry sector.

1.2 New Approaches

We shall further on briefly recount certain changes in the attitudes of countries, communities and individuals that are affecting, or can considerably affect, the forest policies of these countries and that seem to be identifiable and significant in the case of Latin America.

1/ UNASYLVA - Special Edition (dedicated to the Seventh World Forestry Congress), No.104, FAO, Rome, 1972.

2/ FAO Secretariat - "Evolving Responsibilities of National Forest Services". UNASYLVA, Vol.25 (1), No.100, FAO, Rome, 1971.

K.F.S. King - "A plan of action for the next 6 years". Document for the Seventh World Forestry Congress, Buenos Aires, Argentina, 1972.

FIGURE 2
LATIN AMERICA - SELECTED SOCIO-ECONOMIC DATA

Country	Population (in millions of inhabitants)	Area (in 1,000 km ²)	Inhabitants (per km ²)	Gross Domestic Product (per caput in \$)	Inhabitants (per km ² of farmland)	Calorie intake (per caput per day)
	(1)	(2)	(3)	(4)	(5)	(6)
ARGENTINA	23.2	2,777	8.3	1,160	90	3,150
BELIZE	0.1	23	4.3	640	..	..
BOLIVIA	4.9	1,099	4.5	180	160	1,840
BRAZIL	92.8	8,512	10.9	420	310	2,600
CHILE	9.8	757	12.9	720	210	2,460
COLOMBIA	21.6	1,139	19.0	340	400	2,250
COSTA RICA	1.7	51	33.3	560	180	2,470
CUBA	8.4	115	83.0	530	240	2,500
DOMINICAN REPUBLIC	4.1	49	83.7	350	410	1,060
ECUADOR	6.1	284	21.5	290	160	2,040
EL SALVADOR	3.5	21	166.7	300	550	1,890
GUATEMALA	5.2	109	47.7	360	350	2,120
GUYANA	0.7	215	3.3	390	90	2,080
HAITI	4.9	28	175.0	110	1,320	1,720
HONDURAS	2.5	112	22.3	280	310	2,180
JAMAICA	1.9	11	172.7	720	830	2,300
MEXICO	50.7	1,973	25.7	670	210	2,560
NICARAGUA	2.0	130	15.4	430	230	2,380
PANAMA	1.5	76	19.7	730	260	2,520
PARAGUAY	2.4	407	6.0	260	250	2,800
PERU	13.6	1,285	10.6	450	480	2,310
SURINAM	0.4	160	2.5	760	1,030	2,360
TRINIDAD	1.0	5	200.0	940	760	2,360
URUGUAY	2.9	178	16.3	820	150	2,860
VENEZUELA	10.4	912	11.4	980	210	2,460

Sources: (1), (2) and (4): World Bank: "Trends in Developing Countries".
Washington, D.C., USA, 1973.

(5) and (6): 1970 data: "State of Food and Agriculture". FAO, Rome, 1974.

FIGURE 3
LATIN AMERICA - SELECTED FORESTRY DATA

Country	Area			Forest Products		
	Forests (1,000 ha.) (1)	Forests (in % of total area of country) (2)	Dense Forests (1,000 ha.) (3)	Imports: Total Value \$ 1,000 (1974) (4)	Exports: Total Value \$ 1,000 (1974) (5)	Balance between (5)-(4) \$ 1,000 (1974) (6)
ARGENTINA	60,300	22	7,000	157,106	15,360	-141,746
BELIZE	2,000	91	1,630	843	2,564	+ 1,721
BOLIVIA	47,300	43	47,300	3,496	4,860	+ 1,364
BRAZIL	320,000	38	240,000	145,018	208,015	+ 62,997
CHILE	20,686	27	5,000	7,812	122,581	+114,769
COLOMBIA	51,200	45	50,000	27,018	10,891	- 16,127
COSTA RICA	2,200	43	1,800	24,427	3,173	- 21,254
CUBA	1,600	14	1,100	68,900	..	..
DOMINICAN REPUBLIC	1,100	22	990	22,486	31	- 22,455
ECUADOR	18,085	63	8,085	38,810	6,417	- 32,393
EL SALVADOR	260	12	200	13,604	407	- 13,197
GUATEMALA	6,500	60	5,000	18,198	11,825	- 6,373
GUYANA	18,230	85	18,230	4,869	2,458	- 2,411
HAITI	200	7	200	1,089	147	- 942
HONDURAS	7,049	63	7,049	15,302	27,098	+ 11,796
JAMAICA	490	44	77	28,702	81	- 28,621
MEXICO	40,000	20	30,000	167,297	6,160	-161,131
NICARAGUA	6,700	52	6,400	3,482	8,542	+ 5,060
PANAMA	4,080	54	4,080	16,897	9	- 16,888
PARAGUAY	21,000	52	8,000	3,389	23,175	+ 19,786
PERU	71,500	56	65,000	39,422	4,069	- 35,353
SURINAM	14,800	92	14,800	4,440	6,018	+ 1,578
TRINIDAD	235	47	235	27,950	385	- 27,565
URUGUAY	456	3	456	16,031	2,051	- 13,980
VENEZUELA	48,000	53	48,000	48,869	2,474	- 46,395

Sources: (1) and (3): R. Persson - "World Forest Resources". Royal College of Forestry, Stockholm, 1974.

(4) and (5): FAO. Yearbook of Forest Products: Review 1963-74. FAO, Rome, 1976.

FIGURE 4

LATIN AMERICA - INDICES OF ACTIVITY AND TECHNOLOGICAL ADVANCEMENT IN FORESTRY

Country	Man-made plantations (1,000 ha.) (1)	Production of sawn wood (1,000 m ³) (2)	Production of wood panels (1,000 m ³) (3)	Production of wood pulp (1,000 m.t.) (4)	Production of industrial timber (1,000 m ³ (r)) (5)
ARGENTINA	325	767	186	138	2,913
BELIZE	3	..	..	..	..
BOLIVIA	25	115	2	-	275
BRAZIL	1,350	8,935	1,087	741	21,765
CHILE	440	1,085	56	400	3,971
COLOMBIA	40	1,876	115	55	4,775
COSTA RICA	0.3	387	25	-	685
CUBA	215	96	70	-	380
DOMINICAN REPUBLIC	2	100	-	-	412
ECUADOR	45	603	19	-	1,205
EL SALVADOR	..	201	-	-	79
GUATEMALA	1	73	12	4	850
GUYANA	0.2	87	-	-	236
HAITI	0.3	14	-	-	225
HONDURAS	..	457	6	-	800
JAMAICA	12	1	8	-	6
MEXICO	50	1,572	174	319	5,302
NICARAGUA	..	197	13	-	453
PANAMA	4	50	24	-	180
PARAGUAY	21	224	9	-	1,031
PERU	20	245	42	-	635
SURINAM	5	53	35	-	193
TRINIDAD	12	45	-	-	71
URUGUAY	154	73	18	6	148
VENEZUELA	7	328	81	-	585

Sources: (1) R. Persson - "World Forest Resources". Royal College of Forestry, Stockholm, 1974.

(2) to (5): G.D. Fox et al - "Technological Opportunities for Tropical Forestry Development". Agency for International Development, Washington, D.C., 1973.

(Fig.4, continued)

Selected countries in other regions	Man-made plantations (1,000 ha.) (1)	Production of sawn wood (1,000 m ³) (2)	Production of wood panels (1,000 m ³) (3)	Production of wood pulp (1,000 m.t.) (4)	Production of industrial timber (1,000 m ³ (r)) (5)
INDIA	1,100	2,825	161	78	9,863
KOREA		1,773	879	75	2,986
MALAYSIA		3,026	183	-	18,389
PHILIPPINES	100	1,341	661	39	14,400
GABON	25	49	80	-	1,835
GHANA	21	359	32	-	1,920
MADAGASCAR	200	90	1	2	1,436

1.2.1 Economic self-determination and permanent sovereignty over natural resources

Latin America has effectively contributed to the assertion and defence of these rights, today considered fundamental by the Third World. Of the fifty founding member countries of the United Nations, twenty were Latin American (1945). As early as 1952 one of the strongest and most legitimate aspirations of these countries was incorporated by the General Assembly in its resolution asserting the "right freely to use and exploit their natural wealth and resources"^{1/}. Subsequently a body of doctrine of the United Nations on this point became firmly established^{2/}. In 1974 the Sixth ad hoc Session of the General Assembly issued a "Declaration on the establishment of a New International Economic Order" reflecting the adhesion of the entire Third World to the principles of economic self-determination of all peoples, and sovereignty and equity among nations in the international sphere. Illustrations of the application of these principles to concrete national situations in the field of forestry range from the prohibition to export unprocessed timber (Paraguay) to the strictest control or the abolition of forest concessions (Venezuela) and placing strictures on foreign capital investment in forestry enterprises (Honduras). The forestry projects of the Andean programme for technological development framed by the signatory countries of the Cartagena Agreement are one instance of the concrete application of these principles by a group of countries.

1.2.2 The social function of forestry development

A universally accepted view nowadays is that forestry development must directly benefit the rural population, and that the rural population must be directly involved. Recently this idea has gained strength and precision in Latin America. This is shown by reports from several countries, especially from Honduras, Mexico, Ecuador and Peru. As will be seen further on, Honduras' vigorous policy of forestry reform stresses the participation of rural

^{1/} General Assembly, Seventh Session, Resolution 626 (VII), 21 December 1952.

^{2/} In view of their special importance we cite General Assembly Resolutions 2386 (XXIII) of 19 November 1968; 2692 (XXV) of 11 December 1970; and 3016 (XXVII) of 18 December 1972.

communities and the promotion of their welfare. In Mexico there is a clear determination on the part of the authorities, institutions and professional foresters to direct forestry activities towards betterment of the economic situation of the rural population^{1/}. Ecuador's forest policy calls for the offering of incentives to mobilize the people for establishing new forest stands. Peru's recent Forest Law is inspired by the idea that natural resources must be used for social development. Its forest policy calls for doubling of employment in this sector by 1977, while its projects for new settlements in parts of the country where there are forests and wildlife call for a combination of forestry with crop-growing and stock-raising via farmers' associations.

Recently, participants in a FAO/SIDA seminar on timber transportation in Latin America (Oaxtepec, Mexico, 1975) stressed the point that employment opportunities needed to be created in woodland areas and their vicinity in order to halt the flight of the rural population to urban centres. The seminar adopted specific recommendations on education, vocational training, association, and on the forest workers' social security and their working and living conditions.

1.2.3 Protection of the natural environment

In the past few years concern over preservation of the natural environment has captured the imagination of the man in the street. In Latin America this is evident especially in large cities and is accordingly being translated into policies, decisions and activities of countries with large cities. The environmental problems of Mexico D.F. were discussed at the Sixth Session of the North American Forestry Commission. Similarly, in Argentina, Brasil, Colombia and Venezuela, consciousness of this problem has become evident in many ways: in the press, in laws, in administrative set-ups and in research work. Up to now one of the principal institutional consequences of this concern for the environment has been the promulgation in Colombia (18 December 1974) of a "National Code for Renewable Natural Resources and Protection of the Environment", Article 1 of which begins thus: "The environment is a public asset. Both the government and the public must help preserve the natural environment and ensure its management for the public benefit and in the interest of society".

1.3 Development of Institutions

Virtually all Latin American countries have set up PFA's^{2/} and other forestry institutions since 1920. Previously none such existed in most of these countries, mainly due to the lack of proper forest laws or rather the lack of cogent forest policies conceived for the national benefit in line with which laws might have been promulgated. As discussed in Chapter IV, this situation reflects the dearth of professional foresters whose joint efforts could create and propagate a clear understanding of the consequences of misuse of the forest resources.

As the ravages due to reckless exploitation and unsound management of forests more and more patent and the ill consequences evident (loss of soil fertility, floods and degradation of the landscape and of biotypes), the need for appropriate forest laws came to be clearly appreciated. In general, the first forest laws called for setting aside selected wooded areas as reserves or parks. In order to implement and enforce these laws, only small PFA's, such as those usually set up as sections or subsections of the Ministries of Agriculture, were needed. As a rule these small PFA's were staffed by agronomists. No permanent administrative network of field staff but simply occasional check-ups were considered necessary. At any rate, these elementary forest laws provided an initial stimulus for the establishment of the first real PFA's.

1/ Subsecretaría Forestal y de Fauna - Statement prepared by the Dirección General del Desarrollo Forestal for the Tenth National Executive Committee of ANPFAC, Mexico D.F., 1973.

2/ PFA = Public Forestry Administration. This abbreviation is used throughout this study.

In the face of the growing exploitation of forests and the disappearance of the most valuable species, as well as the serious consequences of forest devastation, many countries strengthened and broadened the scope of their forest laws to embrace all forests. Because of this, more supervision and control were necessary. To fulfil these new tasks, territorial or district services were also needed, and the structure of many national PFA's was thus expanded to include permanent outposted services.

During the 1950's countries became ever more conscious of the fact that, aside from timber production, forests have a great influence on the environment, affording also recreational facilities and tourist attractions. Again the structure of many PFA's was broadened to cover these new aspects. Specialized, skilled staff had to be recruited to cope with these additional tasks. The need to coordinate PFA's with other agencies became evident as it became apparent that forests are an integral part of the physical basis for socio-economic development.

These new responsibilities of the PFA's entailed their undertaking the execution of regional development plans within the areas under their jurisdiction and the furnishing of appropriate technical assistance to forest owners other than the government. This further broadening of their activities and the existence of more active field offices presupposed greater competence and a larger number of forestry staff, which reflected in the addition of a third level (i.e. local) in the organizational structure.

From the 1960's until today, the development and diversification of PFA's and institutions came into general acceptance at an accelerated rate. Starting in 1967 autonomous PFA's were created, and since 1970 several state forest enterprises. Semi-governmental forest agencies were organized, large industries developed, and research was fostered. In many countries there was a transition from mere conservation of forest resources to systematic inventorying and management. The main stages of the evolution of these institutions, whose variety and strength has increased until present times, are shown in FIGURE 5.

FIGURE 5

LATIN AMERICA - IMPORTANT STEPS IN INSTITUTIONAL FORESTRY DEVELOPMENT, 1965-1975

Year	Legislative Measures	Organizational Measures
1975	PERU - Law on Forestry and Wildlife	BRAZIL - Move of IBDF Headquarters to Brasilia
1974	BOLIVIA - General National Forest Law	BOLIVIA - Creation of the Forestry Development Centre (CEDEFOR)
	COLOMBIA - National Code for Natural Renewable Resources and for the Protection of the Environment	GUATEMALA - Creation of the National Forestry Institute (INAFOR)
	CHILE - Decree for the Promotion of Forestry	HONDURAS - Creation of the Honduran Forestry Development Corporation (COHDEFOR)
	GUATEMALA - Forest Law	

(Fig.5, continued)

Year	Legislative Measures	Organizational Measures
1973	ARGENTINA - Law modifying the Law for the Preservation of Forest Wealth EL SALVADOR - Forest Law GUYANA - Law on Timber Marketing PARAGUAY - Forest Law	ARGENTINA - Creation of the National Forestry Institute (IFONA) GUYANA - Creation of the Timber Export Board MEXICO - Creation of the General Directorate of Forestry Development (of the Forest & Wildlife Service) PARAGUAY - Creation of the Forest Service
1972	GUYANA - Forest Law HONDURAS - Forest Law	HAITI - Creation of the Special Fund for Reforestation PERU - Organic Law of the Agrarian Sector
1971	ECUADOR - Law for the Promotion of Agriculture, Animal Production and Forestry	
1970		CHILE - Creation of the National Forestry Corporation (CONAF)
1969	COSTA RICA - Forest Law	
1968	URUGUAY - Law for the Promotion of Forestry	COLOMBIA - Creation of the Institute for the Development of Natural Renewable Resources (INDERENA)
1967	NICARAGUA - Law for the Conservation, Protection and Development of Forest Wealth	BRAZIL - Creation of the Brazilian Institute of Forestry Development (IBDF) CUBA - Creation of the National Institute of Forest Exploitation and Development (INDAF) NICARAGUA - Creation of the Forest Service (Ministry of Agriculture)
1966	BRAZIL - Law on Fiscal Incentives for Forestry Enterprises PANAMA - Forest Law of the Republic	
1965	BRAZIL - Forest Code VENEZUELA - Forest Law on Soils and Hydrology	
1964	ARGENTINA - Law on the Preservation of Forest Wealth (1948) CHILE - Forest Law (1931)	
1931	MEXICO - Forest Law (1960)	

Source: Reports in reply to the "National Questionnaire" and FAO data.

1.4 Method and Analysis

A forest policy is far from being a simple matter, it is neither static nor does it correspond to any universal prototype. As W.B. Greely stated, "forest policy cannot be expressed with the clarity of a geometrical theorem".^{1/} T. Francois, on the other hand, said that "a national forest policy is not a combination of principles laid down definitely and forever"^{2/}. Accordingly, we do not intend to try to give a standard definition for "forest policy". What we will do above all is to try and find an answer to the following questions:

- How have forest policies been enunciated?
- What is contained in these stated forest policies?

Secondly, we will examine how forest policies (whether explicit or implicit) became manifest. In order to do so we shall have to determine the nature and extent of intervention of the public authorities in the field of forestry development. Such intervention - or inhibition in some cases - of the public authorities can be described mainly by examining the following points:

- The sphere in which forest policies are applied;
- the functions entrusted to PFA's; and
- the legal instruments for implementing a forest policy.

The rest of this chapter is devoted to the discussion of these points. There are at least two other concrete expressions of forest policy, namely: forestry development planning and allocation of funds for forestry development; these two points will be dealt with in Chapter V.

2. FOREST POLICY STATEMENTS

2.1 Forms of Enunciation

In Latin America, the most usual form of enunciating national forest policies has been by statements in the first articles of forest laws that certain policy objectives and specific functions and duties of the government are in the "national interest" or "for the benefit of the people". Argentina's Law No. 13273 of 1948 is one of the earliest among the laws in force which embody such declarations. Statements similar as to form, although varying in content, are found in many other laws, some of them no longer in force [vis. Honduras' Law of 1961, Guatemala's Law of 1962, and that of the Dominican Republic of the year 1966], while others are still in force [vis. that of Mexico (1960), Venezuela (1965), ~~Guatemala~~ (1966), Costa Rica (1969), Honduras (1972), Paraguay (1973), El Salvador (1973) and Bolivia (1974)].

Such an enunciation of forest policy in forest laws - traditional in Spanish-speaking countries - is not found in English-speaking countries, which as a rule have separate forest policy declarations. Belize, for instance, has, even after its accession to self-government, retained the enunciation of forest policy published by its Governor in 1954.

Recently there has been a trend towards enunciation of forest policy either by presidential or government declaration or by a statement of policy normally issued by the PFA

1/ W.B. Greely - "Forest Policy". McGraw-Hill, New York, 1953.

2/ T. Francois - "Politique, législation et administration forestières". FAO, Rome, 1950.

and approved by the higher executive authorities. An instance of the first is that of Honduras, whose forest policy was recently set forth in an intent and policy message of the President of the Republic. Ecuador's forest policy was stated in a document entitled "Filosofía y Plan de Acción" of the Government. Other recent examples of the second type are Colombia and Uruguay. Colombia's INDERENA set a draft national forest policy that was approved by the Ministry of Agriculture and the President of the Republic. In Uruguay, a resolution of the President of the Republic approved the guidelines for forestry development, contained in a report of the Office of Forests, Parks and Wildlife, laying down the policy of the Ministry of Agriculture and Livestock-Raising in this field. In other countries, Guyana for example, forest policy is from time to time determined by the Government in the context of general development policy on the advice of the head of the PFA. In El Salvador, although the Forest Service has laid down a forest policy, it has not been enunciated officially by the executive authority. In certain countries (Mexico and Peru), the PFA has declared its forest policy which is incorporated in full or in part in the national development plans in order to make it operative. It seems that this approach of inserting government purposes and aims in the field of forestry officially in national development plans and programmes is coming into general practice (see Chapter V).

It is significant that the statement of these policies tends to become an executive function instead of being a basically legislative one. The formulation of general, permanent and to a certain extent static purposes is giving way to more dynamic, more instrumental formulation, deliberately consonant with national socio-economic development policies.

2.2 Contents

2.2.1 Policies stated in laws

Articles 1 and 3 of Mexico's Forest Law (1960) serve to illustrate the contents of forest policy statements incorporated in the basic forest law. In this statement, the Congress of the United States of Mexico decreed essentially that: (a) certain goods and services generated by forest resources are of public interest; (b) the forest law applies to all forest land, whatever the form of tenure; (c) certain functions of protection, conservation, restoration, utilization and industrial use of forest resources are in the public interest and should be so performed as to derive maximum social benefit; and (d) it is up to the national authorities to organize a forest service.

Many later statements of national forest policy hark back to this prototype, although with certain variations. Panama's statement (1966) includes the creation of forest owners' associations and forest workers' cooperatives as being "in the national interest and a fundamental aim of the Government". That of Venezuela (1965) declares it to be in the public interest to establish national parks and to conduct a nation-wide forest inventory. That of Costa Rica (1969) calls for the establishment of forest settlements, the promotion of forestry research as well as forestry education and training and informing the public about the value of forest resources. That of El Salvador (1973) declares it to be in the public interest to have forest resources utilized for maximum social benefit. That of Costa Rica (1973) specifically embraces all renewable natural resources under the system established by the Forest Law. That of Bolivia (1974) declares it to be in the public interest to extend the benefits of forest production and development to the whole rural population. On the whole, the more modern policy statements make much reference to touristic, and wildlife protection and environmental protection services. As regards forest policy instruments, ever greater importance is attached to public information, education, research and cooperation.

Despite notable differences, all forest policy statements uphold the principle of the social function of the forests, the use of which is subordinated to the public interest. In the case of Mexico this principle emanates directly from the Constitution of the Republic which proclaims the right of eminent domain of the nation over the country's natural resources to be inalienable and imprescriptible. Other constitutions proclaim similar principles. Bolivia's Forest Law (1974) states that "all forests and forest land belong to the State and are public domain governed by the provisions of that law, whatever the land

tenure system under which they are held". Peru's recent Forest and Wildlife Law (1975) states (Art. 1) that "forest and wildlife resources are public domain and no private person may acquire rights thereto". Other countries (Costa Rica, Guatemala and Venezuela) also enunciate the limitation of the right of private forest ownership in the public interest, though in a less forceful fashion (see Section 4 of this chapter).

2.2.2 Statements of forest policy by executive decree

As already mentioned, such statements of forest policy are very closely tied with the current socio-economic policy of governments. For instance, concern over the use of forest resources for the maximum social benefit, expressed in Mexico's Forest Law of 1960, was made more specific in 1973 in the following principles of forest policy^{1/}: (a) forest utilization is a good means for promoting rural development and bettering the socio-economic conditions of the rural population; and (b) forests afford employment opportunities and should contribute as much as possible to capital formation.

In the case of Honduras, the Presidential Decree of 3 January 1974 called for "placing complete and effective control over forests in the hands of the State" and gave special attention to the rural communities in the vicinity of forests. The priority goals set are: (a) development of forest industries; (b) control over the domestic market and exports of timber; and (c) creating an effective PFA with ample executive powers. Peru's national forest policy calls for the strengthening of the activity of government agencies; laying down guidelines for, and establishing, settlements in forests; obtaining more information about the forest resources; promoting cooperative and workers' enterprises; utilization of forests with an eye to economies of scale; conserving wildlife; incorporating maximum value added to raw materials obtained from forests; optimizing industrial output, gaining a better foothold on world markets; increasing domestic supplies; guiding public opinion; and asserting national sovereignty.

2.2.3 Policy statements in English-speaking countries

The major lines of forest policy in Guyana reflect government aims of (a) developing the nation's forest resources within the framework of an integrated land-use policy; (b) managing forests on a sustained yield basis; (c) increasing production with a view to covering the country's requirements, developing secondary processing industries and exporting a maximum of forest products; (d) guaranteeing good yields from forest utilization; (e) developing new markets; and (f) providing access to forested areas.

The main aims of Jamaica's forest policy - a model of concision - are: (a) to conserve the nation's soil and water resources; (b) to supply raw materials for future wood-using industries; (c) to afford employment opportunities, especially in rural areas; and (d) to incorporate under-utilized land or wasteland into the production system.

Belize's statement of forest policy (1954) underlines the need to create, maintain and develop the country's forest resources on land that (a) is unsuitable for agriculture, (b) is capable of producing more on a sustained yield basis under a forest regime, (c) needs to be kept under forest for protection purposes, (d) is required for the production of firewood and timber for local use, and (e) should be set aside as nature reserve.

^{1/} Subsecretaría Forestal y de Fauna, op. cit.

3. OPERATIONAL FEATURES OF FOREST POLICIES

3.1 Scope of Implementation of Forest Policy

The expression "forestry sector", which originated in economic analysis, has acquired in recent language and literature a meaning closer to the "scope of implementation of forest policy"^{1/}. This analogy of meaning is useful, although it may introduce a restrictive or overly static idea of what is meant by forest policy. For the purposes here, the term "forestry sector" covers all activities based on forest land as well as the goods and services that society derives from such land^{2/}. K.J. Mustanoja^{3/} described the forestry sector as a system (FIGURE 6). The more or less broad interpretation each country gives to the term helps define what might be called the "apparent scope of forest policy" in that country.

In Latin American countries this apparent scope includes, as a minimum, all work having to do with conservation, protection, administration, management and utilization of natural stands and man-made forests. Certain aspects of environmental protection (soil erosion control, regulation of streamflow) are also considered typical components of the forestry sector in all the countries discussed. The administration of national parks and wildlife protection are considered as belonging to this sector in most of the countries in question, save Argentina, Colombia, Guyana, Haiti, Jamaica and Nicaragua.

Forest industries, domestic marketing and foreign trade in forest products belong to the forestry sector in most countries. This does not imply that their PFA's necessarily have exclusive responsibilities in these areas. It merely means that the development of forest industry and trade has been taken into account in defining forest policies and their objectives.

In short, the following points as regards the scope of forest policy in Latin America seem to be the ones most liable to change, being now in course of evolution: (a) environmental protection; (b) management of renewable natural resources in general; (c) forest industries development; and (d) organization of the commodity market for forest products.

3.2 The Institutional Role of PFA's

Most basic forest laws in force in Latin America dedicate a chapter, or at least several paragraphs, to the role of the administrative organization responsible for the accomplishment of the purposes of the forest law. What is called "Public Forestry Administration" in this study, receives various denominations in Latin American countries, such as: "Administración Forestal" in Costa Rica, Mexico and Venezuela; "Administración Forestal del Estado" in Honduras; "Organización Forestal" in El Salvador; "Servicio Forestal" in Panama; "Servicio Forestal Nacional" in Paraguay. Certain autonomous PFA's (those of Brazil, Cuba, Honduras and Guatemala) have their terms of reference spelled out in the respective foundational laws. In some instances, the purposes of the PFA are set forth, or explained, in provisions pertaining to the organization of the entire agricultural sector, as happens in Ecuador (Organic and Functional Law governing the Ministry of Agriculture) and in Peru (Organic Law governing the Agricultural Sector). The legal instrument establishing the PFA's is always of high standing, even in the case of such administrations that have only very modest means. This confirms the fact that the role of PFA's is not circumscribed to the provision of certain services, but as a rule also embraces policy-making and regulatory activities which cannot, because of their very nature, be assigned by regulations of lower

1/ This is true for legal texts as well. Honduras' Forest Law of 1961 (which has now lapsed) already used the expression "forestry economic sector". Bolivia's Law of 1974 speaks of the "forest resources sector".

2/ J. Frats Llauradó et al - "Fomento Forestal y Reforma Agraria". Document of the World Conference on Land Reform. FAO, Rome, 1966.

3/ K.J. Mustanoja - "Public Administration and Organizations for Forest Industries". Document presented to the FAO/FINLAND Seminar on Sawmilling and Other Mechanized Industry in the Amazon Basin. November 1974, Belem, Brazil.

FIGURE 6

COMPONENTS OF THE FOREST AND FOREST INDUSTRIES SYSTEM

RESOURCES

Forest resources -
timber, soil and
water protection
(conservation of
flora and fauna)
Wildlife

FORESTRY
SECTOR

Fuel, chemical
products
Infrastructure
Information
methods, data and
general relations
Equipment
Organization
Labour

FOREST
INDUSTRIES

FUNCTION OF THE ORGANIZATION
OF MANPOWER RESOURCES

Forest management
Seed collection
Plant production
Plantations
Protection

FORESTRY
SECTOR

Industrial Timber

TANGIBLE AND INTANGIBLE PRODUCTS

Physical products

Water
Timber
Wildlife

FORESTRY
SECTOR

Other products

Environment &
amenities
Financial income
& employment

FOREST
INDUSTRIES

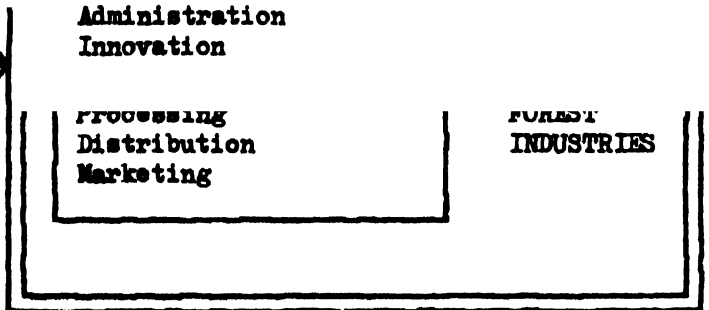
Timber extraction
Timber transportation
Improvement of products
Research
Planning
Policy definition
Training
Administration
Innovation

Processing
Distribution
Marketing

FOREST
INDUSTRIES

Physical products

Industrial
products



status. In fact, according to the principle of public interest which, as was said, is a feature of forest policy statements, the PFA's of Latin America have to a greater or lesser extent two fundamental institutional purposes, namely: (a) to administer state-owned forest resources and (b) to perform work in the public interest on all land defined as forest land no matter under what form of land tenure. Such work may include promotion, guidance, and supervision of private enterprise (as in Guatemala) or may call for a considerable amount of direct intervention (as in Honduras).

Another special feature of PFA's common to all of them is the heterogeneity and multiplicity of tasks included in their terms of reference. Article 12 of Forest Law 22 of Paraguay (23 November 1973) illustrates this point (see FIGURE 7). As will be seen in Chapter III, the complexity and geographically dispersed jurisdiction of PFA's are significant factors in determining their organizational set-up and manner of functioning. The institutional terms of reference of PFA's will therefore be gone into in some detail in the next sections.

FIGURE 7

LATIN AMERICA: INSTITUTIONAL TERMS OF REFERENCE OF A PFA
(PARAGUAY)

- (a) To frame forest policy in conjunction with other government bodies working in the field of economic development;
- (b) to administer the forest fund set up by law, as well as its assets and installations;
- (c) to inventory the country's forests and renewable natural resources;
- (d) to prepare forest maps, maintain cadastral records and classify forests and forest land;
- (e) to control forest operations, forest management and management of renewable natural resources;
- (f) to undertake studies on technology and standardization of forest products jointly with the National Institute of Technology and Standardization;
- (g) to establish forest nurseries for the production of plants for afforestation and reforestation;
- (h) to set sales prices on commodities derived from state-owned forests and nurseries;
- (i) to manage and administer state-owned forests;
- (j) to demarcate forest reserves;
- (k) to supervise and establish regulations concerning the conservation, restoration and utilization of forest land;
- (l) to apply the sanctions envisaged in the law;
- (m) to protect forests against fire, pests and diseases;
- (n) to protect wildlife and regulate hunting and fishing throughout the country;
- (o) to promote the establishment of forest settlements and foresters' cooperatives as well as the creation of community forests; and

- (p) to lay down rules and regulations governing the utilization of both government and private forests on the advice of the Consejo Asesor (Consultant Board) as approved by a decree of the highest executive. In laying down these rules and regulations, the following points have to be taken into account: cost of production, sales price, species, quality and end use of products.

Source: Article 12 of Law No. 422 of 23 December 1973.

Framing of forest policies and plans. - Among the main functions of all PFA's studied is the framing of forest policy to a greater or lesser extent. In some cases the PFA is expected to "put forward proposals" regarding policy; in others, it "studies and prepares" policy; and in still others, it "formulates" policy. As a rule, PFA's collaborate with other branches of the Public Administration. The same applies to sectoral forestry development plans which are normally an integral part of overall national development plans.

In order to fulfil this task, the PFA's require at least: (a) machinery for liaison and cooperation with high-echelon public agencies involved with planning and decision-making; (b) the means for obtaining, analyzing and processing economic and statistical data; (c) the means for surveying and inventorying forest resources; and (d) machinery for collaboration with public and private bodies active in the forestry sector, and for maintaining public relations and public information services in general. Policy-making usually entails participation in the preparation of bills of law and draft rules and regulations, which also requires specific capabilities in this field.

Enforcement of forest laws. - This is one of the best defined and most traditional functions of PFA's. Almost all basic forest laws are very explicit in stipulating that the PFA's are the main public agencies responsible for ensuring enforcement of forest laws in collaboration with the executive and judicial branches of government. Honduras' Forest Law of 1972 states, for instance, that the "Administración Forestal del Estado" is the administrative body under the Ministry of Natural Resources having the specific function of implementing the law. There are analogous provisions in the forest laws of Argentina, Bolivia, Brazil, Chile, Colombia, El Salvador, Guatemala, Mexico, Peru, Uruguay and Venezuela.

The minimum requirements of any PFA so as to enable it to fulfil these functions are: (a) a field organization capable of preventing, discovering and denouncing infractions of law often in the most remote and least populated parts of the country, i.e. a forest guard corps; (b) the means for technical and fiscal control over forestry operations; (c) the capability of assessing the ecological impact of any kind of intervention in forest stands, and (d) the power to issue rules and regulations governing such action and ensure their enforcement.

Administration of the country's publicly-owned forest resources. - This too is a task invariably assigned to the PFA's. If the State owns only very little forest land, as in the case of El Salvador, Paraguay and Uruguay, this may be a secondary task, but as a rule it is an extremely important function that is usually beyond the actual capability of most PFA's today.

In order to be able to perform all these tasks, the PFA's require efficient technical and managerial staff capable of identifying, delimiting, surveying, mapping, managing, protecting, improving and utilizing State-owned forests. This is a genuine entrepreneurial task which a bureaucracy of the kind that is common in Public Administration can hardly perform. This is why this role has much importance in shaping a type of organization that is appropriate for the PFA's.

Forest protection. - PFA's have the general task of forest protection (primarily against fire, pests and diseases) throughout their countries. Accordingly, in addition to the protection duties that are part of the administration of the government-owned forest resources, PFA's must have services that provide a minimum of information, as well as organizational support in order to protect all forests, whether privately owned or belonging to communities. This requires a broad logistic base and communication facilities as well as specific technical know-how and effective coordination with local bodies and other groups.

Other functions often assigned to PFA's include:

- the establishment of new forest resources, whether directly or by supporting private enterprise (national afforestation plan, technical assistance, etc.);
- administration of national parks (although certain countries, for example Argentina, have separate administrations for this purpose);
- protection of wildlife and fisheries; promotion of recreation amenities and tourism;
- development and regulation of forest industries;
- development and regulation of transport of, and trade in, forest commodities.

4. LEGAL INSTRUMENTS

4.1 The Law as a Means for Implementing Policy

Legislation is an important tool for bringing about or encouraging social attitudes and behaviour that conform with the values and objectives set by the law-makers, and producing effects consistent with their policies. Forest laws, like any other laws, must be viewed as something dynamic. Their adequacy must be judged according to the efficacy of the means brought into play in order to induce social behaviour favouring the implementation of the policies that underlie the law.

Legislation pertaining to forests usually takes the form of either codes, laws, ordinances, decrees or regulations. A distinction has to be made between a code and a normal law, as well as between laws and subsidiary legislation (regulations). In the Latin American juridical hierarchy, a code ranks, as a rule, on a higher level than a normal law, as can be appreciated from the procedures for enactment and amendment. Colombia's promulgation of a national code governing its renewable natural resources and protection of the environment makes an interesting case, as its Constitution requires the fulfilment of certain requisites for the enactment or amendment of codes, thereby rendering them an enduring entrenchment for basic legal provisions, while at the same time imparting a certain inflexibility to them.

Colombia's new code raises the interesting question as to whether or not it is advisable to legislate on all renewable resources as well as on environmental protection in one single code. No doubt the resolution of this issue ultimately hinges on circumstances in each country. Nevertheless it must be stated that a single code has the advantage of postulating a comprehensive, integrated policy towards all renewable natural resources and the environment. On the other hand it must be recognized that certain parts of the law governing natural resources may be less ripe than others for codification. So one must be careful not to allow that pressure to promulgate a unified code leads to the premature entrenchment of basic provisions pertaining to any given sector before all the issues involved have been analyzed and before the corresponding policy has been settled.

In the case of federations it is best to keep in mind the respective jurisdictions of the Federal Government and the federated states or provinces in legislating in the field of forestry. Brazil's Constitution confers upon the Federal Government exclusive power to pass laws on forests, hunting and fishing (Article 8, XVII-4). According to Mexico's Constitution (Article 27) it is up to the National Government to regulate the use of all natural resources subjected to appropriation. In Argentina, on the other hand, the responsibility for legislating on forestry matters is incumbent upon the provinces under the concept of residual legislative powers (Articles 67 and 104 of the Constitution). The approach adopted in its Forest Law (1948) for the solution of this jurisdictional problem has been that of negotiating and reaching agreements with the various provinces which commit themselves to enforcing the forest law within their respective jurisdictions in exchange for federal aid.

4.2 Forest Resources as Public Assets

Although not stated clearly in all laws, public forest land in Latin America is usually considered a national asset (or as belonging to townships or communities, as the case may be)

which the PFA's hold in trusteeship or custody. Frequently the law prescribes that certain forests and forested lands "belong to the State" or are "State property". Still, even in this case, such state-owned property is not interpreted strictly as implying full ownership. The State, represented by its PFA, exercises possession and can collect rent or draw revenue or income from the forests, but cannot exercise all ownership rights, since these forests are public assets that have to be administered in a certain way in the public interest or for social purposes. Precisely in order to achieve these purposes it is left to the PFA's to do the inventorying and be responsible for the conservation, improvement and utilization of these assets. That is why these administrations are given their own "private" property (buildings, instruments, etc.) and are allocated funds.

The public assets for which PFA's are responsible in Latin America vary greatly. In Guyana 84% of the forest land belongs to the State, 15% being set aside for Amerindian communities, with only 1% in private hands. In Uruguay, on the contrary, 96 to 98% of the forest land belongs to private owners and the situation in Paraguay and El Salvador is somewhat similar. In absolute figures great amounts of public land are under the jurisdiction of PFA's in Bolivia, Colombia and Peru, to mention only some significant instances. Even in countries where private stands are abundant or even predominant there are still vast tracts of public forests (Argentina, Chile, Mexico, etc.).

In the face of the problem of effective administration of tremendous expanses of land, which in the past were virtually considered vacant land or res nullius, some countries, like Brazil, seem to have opted for turning a good portion of such land over to private owners, setting aside the rest as forest reserves, national parks and similar kinds of reserves^{1/}. The policy as far as Brazil's Amazon is concerned is to encourage the establishment of private estates (including production forests), always provided that this is in consonance with the aims of national and regional development. The sale of vacant public land lying along major communication routes is generally in the hands of INCRA and requires the approval of either the State Legislative Assembly or the Federal Senate according to the size of the tracts of land. The most recent legal measures governing the purchase of rural property are found in Decree No. 74 965 of 26 November 1974.

But most countries where the eminent public domain over vast tracts of forest land has not yet been made good in terms of active possession seem to be opting for a solution based on the development of the public sector. This appears from the restrictions which many countries are imposing on alienation of public forest land, especially when it fulfils important social functions. In Honduras, for instance, inalienable public forest domain has been established by law, comprising land, title to which can only be changed by passage of a law by the National Congress. In Paraguay, State forest land declared to be forest reserves is inalienable save for land which, in the interest of society or as a result of pertinent technical research, is deemed appropriate for land settlement (Forest Law of 1973, Article 10). Argentina's Forest Law contains a similar provision.

Apart from the inalienability of public forest land, the laws as a rule contemplate the possibility of expropriation of private forest land. Normally this right of the State to expropriate is based on a system of land capability classification by which it is possible to identify those tracts of land where firm State control for the benefit of society is most necessary. Paraguay, for instance, (under its Forest Law of 1973) can expropriate forest land when this is essential for erosion control, watershed and cropland protection, or for public health reasons. Argentina's Forest Law permits the expropriation of forests "classified as protection and/or permanent as well as of any other real estate where afforestation or reforestation is considered the best land use". Law 20 531 (1973) prescribes that IFONA shall set aside at least 15%, but no more than 30%, of its funds for land acquisition. Expropriation proceedings often run into great difficulties of a practical nature (financial, political) so that it cannot normally be considered an important means of implementation of forest policy. Only in a single country, Belize, where most forests were once in private hands, has the Government been systematically acquiring land in lieu of collecting taxes.

1/ Instituto Brasileiro de Desenvolvimento Florestal: "Amazonian Forestry: present situation, perspectives for its development". Rio de Janeiro, 1975.

In general, as we will see in Section 4.3, although new forest laws envisage recourse to expropriation in extreme cases, they establish other easier means of implementation (i.e. without fundamentally changing the land tenure situation) in order to achieve greater public control over the use of forest resources.

A very important aspect of legal control of the public forest resources pertains to their utilization which is often left to private enterprise through the granting of concessions, licences or felling permits. FIGURE 8 shows the relative size of the public domain forests now granted under utilization contracts in various countries of South America^{1/}. Forest laws prescribe the main features of such contracts: their duration, maximum area, period for which the licences are granted, prerequisites, manner of payment, supervision, obligations, etc. In Brazil utilization contracts are granted only in reserve production forests. In Peru contracts are granted on the basis of technical and economic feasibility studies for up to a maximum of 100,000 ha. and for 10-year periods (renewable). In that country the granting of contracts to small entrepreneurs is favoured. In almost all countries a management plan, worked out by professional foresters and approved by the PFA, is required for the working of any stands (as in Bolivia, Colombia, Costa Rica, etc.). In some countries, namely Honduras and Peru, preliminary contracts for forest surveying may be granted; the findings of surveys must be communicated to the PFA, however.

In recent years many governments have attempted to define more clearly the conditions under which they are prepared to issue contracts for utilization of public forest land and for strengthening supervision over such operations. It is now recognized that such contracts involve a wide range of problems, not only legal ones, but also economic, technical and social ones, and that they are an important feature of forest policy and administration. Several countries (Ecuador, Honduras and Surinam) are engaged in a thorough reorganisation of their contract system and almost all of them are paying greater attention to matters such as land classification, stand inventorying, management plans, planning of industries, supervision of operations and determination of forest taxes. On the whole these important aspects of forest utilization contracts can be said to have been given little attention until recently. In Latin America there is much evidence of how the traditional system of contracts ("concessions"), in addition to being improved upon, is gradually being changed to more advanced forms of organization of forest utilization on public land, the new forms ranging from semi-governmental ventures to the adjudication of "supply areas" to forest industries.

4.3 Forests as Private Property of Public Interest

As has been said, in the case of private forest holdings, the purpose of the law is to govern social behaviour for reasons of public interest. This is accomplished in several ways: (a) by placing constraints on property rights; (b) by classifying forest land according to its degree of public interest; and (c) by extending the public forest regime to private forest holdings. Other means consist in offering economic incentives, informing and educating the public as well as providing technical assistance, matters which will be dealt with in another context (Chapters V and VI respectively).

4.3.1 General constraints

To a certain extent all forest legislation will imply certain restrictions on private property rights. For this reason most forest law in Latin America begin by declaring forests to be assets of value to the public, and by stressing the social benefits of the conservation and sound use of forest resources. Were it not for this feature, doubt might be cast in many countries upon the constitutionality of placing restrictions upon the exercise of private ownership. Although in many cases such constraints are not of great scope, in other instances the impact is so great that property owners actually have no real freedom in

1/ F.J. Schmidhisen - "Forest Utilization Contracts on Public Land in the Tropics: Experiences, Problems and Trends", FAO, Rome, 1976. See also by the same author: "Handbook on Forest Utilization Contracts on Public Land", FAO, Rome, 1972.

FIGURE 8

PRODUCTION, EXPORTS AND AREAS UNDER WOOD UTILIZATION CONTRACTS

Year 1973

	Total annual log production (industrial roundwood) ^{1/} Million m ³	Export value of forest products ^{1/} Million \$US	Estimated area under utilization contracts Million ha.
FAR EAST^{2/}	93	2,314	≈ 40
Indonesia	27.3	633	12.5
Malaysia	26.4	642	5.5
Papua New Guinea	0.8	16	1.1
Philippines	13.8	406	8.5
AFRICA^{2/}	43	693	≈ 50
Cameroon	1.3	38	9.0
C.A.R.	0.5		1.2
Congo	0.7	49	1.7
Gabon	2.4	105	7.0
Ghana	1.9	111	2.9
Ivory Coast	5.7	278	6.7
Liberia	0.5	14	4.8
SOUTH AMERICA^{2/}	42	377	≈ 10
Colombia	4.9	8	0.5
Ecuador	1.9	6	0.3
French Guyana		0.5	0.1
Guyana	0.2	2	0.9
Peru	0.8	4	0.6
Surinam	0.2	4.7	1.5

^{1/} Yearbook of Forest Products, 1962-1973, FAO.

^{2/} Total for the region.

the management of their forests, although they retain their basic rights to transfer their property (sale, inheritance, donation) and to enjoy the benefits, produce or income therefrom. The most usual restriction is the requirement of a licence or permit from the PFA in case the owner wishes to change the form of land use (e.g. in El Salvador, Argentina, Colombia, Paraguay, etc.), such permits usually being required except in special cases (expansion of irrigation districts, establishment of nurseries, construction of buildings, etc.). Very often felling licences are only granted on the basis of a working plan.

4.3.2 Land capability classification and special restrictions

Many Latin American forest laws contain land capability classification systems intended for the application of special restrictions. Such classifications are usually based on the best land use or the main influence or attribute of the land in question, forest stands generally being classed in either protection, production or special use categories. Such is the case in the forest laws of Bolivia, Colombia ("Código"), Honduras and Panama, for instance.

Even if there is no such land classification, forest laws, as a rule, call for the delimitation of areas over which special control or supervision is exercised in the public interest. Thus the Forest Law of Costa Rica (1969), founded on the principle of multiple-use forests, prescribes that forest zones (including private holdings) may be set aside as soil protection areas, for streamflow regulation or for the protection of the climate or of the environment. In Argentina, declaring a forest a protection forest automatically entails certain restrictions on ownership and certain obligations upon proprietors; the latter are also entitled to compensation if they have suffered loss of income due to these restrictions.

4.3.3 Adherence to the regime governing public forests

Certain laws, for instance those of Costa Rica, allow for voluntary adherence to the public forests regime by forest owners whose holdings are included in a special register. In compensation, the owners receive certain benefits such as technical assistance, tax exemption and priority in obtaining credit. Similar provisions are found in the Forest Code of Brazil. Special interest is shown by Mexico in the idea of the Forest Management Unit through which cooperation between the PFA, forest owners and industry is fostered. For each large-scale unit, forestry operations can be soundly organized according to economic and social principles, such units often being composed of several holdings each under a different kind of land ownership.

4.4 Legal Obstacles to Good Management and Development of Forests

So far we have considered forest laws as instruments for implementation of policy. In point of fact, individual policies adopted to deal with various requirements of economic and social life are not always well coordinated. Furthermore, it is difficult to foresee all possible repercussions of any law intended to implement a specific policy. It may happen that certain laws having nothing to do with forests, or even certain provisions of a forest law itself, may actually run counter to forestry development.

This fault is often found in laws governing changes in land use or in fiscal laws. For instance, unless great care is taken in writing laws to promote agricultural settlements, they may become an inducement to clear forests instead of achieving permanent viable settlements. The repercussions of fiscal regulations can be seen in connection with the new Forest Law (1974) of Guatemala, which rules that land covered by either growing stands or stands in which lumbering is being done or that are set aside as forest reserves may not, according to this law and its bylaws, be considered as "uncultivated land or vacant land; land under man-made plantations is considered cropland, as is also land under national forests managed by, or under the technical supervision of, INAFOR". Presumably this provision corrects a prior precept placing on forested land the onus of considering it indiscriminately as idle, vacant or uncultivated and consequently capable of being cleared for pastures (perhaps of low productivity) contrary to the real intention of the law-makers.

Among forest law clauses that have proven counterproductive should be included first of all those that overestimate the real capacity of the PFA's, of forest owners and even of the judicial system itself. Examples are the generalized and detailed control over timber haulage and transport, the detailed statistical processing even of unreliable data, the obligation to submit to PFA's forest working plans or management plans of disproportionate complexity and the exacting of penalties so severe in comparison with the seriousness of the infraction that the judges cannot, or are reluctant to, enforce them. The corollary to all of this is that forest laws must be judged largely by the efficacy and selectivity with which they guide the PFA and concentrate its efforts on achieving a pertinent and realistic implementation of forest policy.

4.5 Law Enforcement and Sanctions

Forest laws are enforced partly by persuasion, incentives and education, and partly by coercion in the form of sanctions for violations provided for therein. Normally a distinction is made between serious crimes (delitos) and minor offences (faltas). Since crimes or felonies fall within the jurisdiction of ordinary courts of justice and are punishable by penalties including prison terms, the responsibility of the PFA's is normally confined to their reporting and providing of proof, and to apprehending the presumed criminals and delivering them to justice. As for misdemeanours which are punishable only by monetary fines or penalties, in many countries they come under the administrative law (that is, the rules of the PFA itself) with possibility of recourse by the presumed perpetrators of the misdemeanour to higher administrative authorities (for instance, the minister) and ultimately to the regular courts (see the forest laws of Argentina and Honduras). The important duty of reporting infractions and apprehending the presumed perpetrators is normally entrusted to the forest guards corps (as in Honduras), the members of which are usually considered agents of the administrative/judicial authorities when on duty within their own areas of jurisdiction.

Many countries have adopted provisions to make payment of fines and possibly payment of damages commensurate with the seriousness of the offences. In Guatemala the fines depend on the number of trees cut or damaged (Forest Law, Article 58); in Mexico the fine depends on the volume of timber illegally extracted or the area deforested (Forest Law, Articles 127-129). It is interesting to note that in Brazil the impact of inflation is reflected in the setting of fines in terms of the minimum wages in force at the time and place of the infraction (Forest Law, Article 26).

Control to ensure observance of contracts for utilization of public forest land and related problems is a separate matter dealt with in various ways and not always successfully by different countries (compare with 4.2). Very often no specific rules are embodied in the laws in this regard, the clauses of the contract itself constituting the sole basis for the control and implementation thereof. Yet, as a rule, the laws do lay down general guidelines, as does the Forest Law of Argentina which prescribes that any transgression of the approved plan is to be considered a misdemeanour. Peru's Forest Law (1975) specifies possible reasons for the rescinding of contracts for the extraction of timber and the correct procedure for denouncing them. Many countries (including Honduras and Costa Rica) have laws requiring that bond be deposited by the concessionaires, which can be confiscated in case of demonstrated failure to comply with the terms of the contracts. One very general and important rule is that PFA agents shall have free access in the course of duty to lumbering sites and to roads, plants and offices of concessionaires for supervision and surveillance purposes (see Forest Law of Panama, 1966, Article 52).

CHAPTER III

FUNCTIONS, ESTABLISHMENT AND STRUCTURE

1. FUNCTIONS AND ACTIVITIES

The mandate and powers of the PFA's examined in Chapter II determine the activities these administrations perform. One may say, therefore, that these activities are specific to the PFA's. On the other hand, the mere fact that the PFA's are organizations means that certain functions common to any organized system must take place in the PFA's. This is made clear by comparing an organization with a living organism which has certain functions (physiological functions such as respiration or nutrition) common to all living beings and indispensable for their survival.

In simple terms it can be said that the forest policy determines the mandate and powers of the PFA; the mandate and powers in turn determine the PFA's activities. On the other hand, the functions of the PFA will be those of any organization (see 1.1 below), although the relative importance and detailed character of these functions will be influenced by the type of activity carried out by the PFA.

The whole process of implementing a forest policy consists of the functions and work performed by the staff of a given PFA in a specific context, according to certain laws, regulations and manuals, and using certain physical means. All of this must be reflected in the field office structure of the PFA and in its type of management, division of labour and allocation of responsibilities. The formal and physical aspects of this aggregate form is the so-called "organizational set-up" of the PFA.

1.1 Functions

According to administrative science, the functions of an organization are:

- decision-making
- execution (putting decisions into effect)
- cooperation
- supervision and control.

Sometimes the furnishing of supplies, production, marketing and administration are also considered functions. This interpretation is valid for the analysis of the various parts of a business or private enterprise, but not for that of a public administrative body.

By decision-making is meant the wise choice of the best option or alternative among all possible ones in order to accomplish a specific task. In PFA's several kinds of decisions have to be taken. There are the mandatory decisions as to implementation of laws, decrees, contracts, etc., i.e. those regarding the structuring of the organization at different levels, its geographical set-up, and its liaison and interrelationship with other public agencies or institutions (especially in federal countries like Argentina, Brasil and Mexico). Into another, analogous category fall decisions relating to the establishment and organization of fire-fighting services (Colombia, Chile) and to the control of pests and diseases, the creation and administration of national parks (Argentina, Peru, Venezuela), forest inventorying (Chile, Mexico, Peru) and, in all countries, report writing and statistical work in the forestry sector. In all cases it is necessary that PFA's make detailed decisions according to legal prescriptions.

Another category of decisions includes those relating to planning and programming. As a rule these decisions are taken on the basis of laws and decrees (sectoral planning, regional planning, etc.) and therefore can be described as mandatory decisions. There is a difference, however, in that in this case the PFA is normally allowed great flexibility

and can influence decisions. In planning for State forests, for instance, the PFA reaches decisions virtually independently, although of course within budgetary constraints. Decisions on the annual programme of work of the PFA's (see that of Peru, 1974) also come under this heading, as do the budgeting and assignment of duties and tasks. In making decisions of this type one normally adheres to manuals on the subject (Chile: Manual para planes de manejo), and in all countries, rules governing budgeting must be followed.

A third category of decisions are those which PFA's take on their own initiative, sometimes following formal rules on manner of presentation, but without having to adapt decisions to substantive norms. The bringing of bills of laws before legislative bodies for passage and the submission of recommendations for necessary changes in the organizational set-up illustrate this point.

Cooperation includes all liaison between PFA's and other agencies or institutions of either the public or the private sector. This very important function is described in Subchapter 2. Cooperation has manifold purposes such as: coordination, planning (whether regional or national), budgeting, information (pertaining to strategies and policies of other institutions, forestry research findings), presentation of joint initiatives (changing the forestry education system), technical assistance, social welfare, etc.

Cooperation is usually developed on the basis of internal rules of procedure (regional planning, budgeting), conventions (education, research), or statutes (associations of various categories of workers). Very often cooperation expedites the work of the PFA's, cutting red tape and avoiding overstaffing of specialized offices within the agency itself.

Execution means putting decisions (plans, etc.) into effect, using various ways and means and techniques.

On State forest land, the PFA itself normally implements plans and carries out annual programmes of work through its own organizational efforts. Execution may include reforestation work, silvicultural treatment, lumbering, timber haulage and transport, construction and maintenance of roads, procurement of equipment, payment of salaries and wages, book-keeping, etc. Where there are special agencies for this purpose, the PFA also does research work (Chile, Ecuador, Mexico). Other examples of direct execution are measures for the establishment and maintenance of national parks, erosion control work, personnel training, inventorying, etc.

In areas where land does not belong to the State, execution may, for instance, entail the enforcement of laws (determination of which land is to be under forest - as in Chile; reporting on what concessionaires are doing - as in Ecuador; compilation of statistical data, etc.). Also included is the furnishing of technical assistance to non-governmental landowners; in the latter case, the PFA acts as a servicing agency.

Surveillance and control work may apply to both State forests and private forests. In the first instance, the PFA exercises control through its higher-echelon staff. The purposes of control are, among others, to discover differences between the original goals in the annual plans and actual performance, or how the budget is used, or the manner of accountancy and auditing, what training has been given, or how public relations programmes are conducted, etc. The control and surveillance of private land may have several goals, such as: to ensure that felling operations conform with laws and regulations in force; to check on the execution of obligatory tasks such as reforestation, stand protection against fire and erosion; to ensure compliance with timber marketing standards as well as with rules and regulations governing imports and exports, hunting and fishing, and so forth. In this sense the PFA acts as a control agency. The details of control and surveillance work are found in clauses of laws, in handbooks, and in rules and regulations (those of Mexico, for instance).

Duties and functions for each office or unit are set forth in organizational charts or diagrams.

1.2 Activities

Activities can be defined merely by the results to be achieved, viz: reforestation, lumbering, technical assistance, and so forth. A breakdown can be made into component tasks. For instance, reforestation embraces the delimitation of areas, selection of tree species, land preparation, procurement of planting material, etc. This definition of work, which does not indicate the manner of execution, does not lend itself to analysis of the organizational set-up. Another definition of the term "activities" indicates how the component tasks are to be accomplished, taking into account the means (techniques and methods), areas of competence, staffing, sequence of work, coordination with other tasks, as well as deadlines and time allowed for execution; in short, this definition includes all pertinent organizational work for job execution. This is a more operational definition of "activity", as it indicates not only the tasks and the methods or techniques for performing them, but also the units (manpower or staffing, machinery, etc.) needed to solve the problem of organization.

It is neither possible nor desirable to list here all activities and tasks of PFA's, since circumstances vary greatly from country to country. It seems better to explain the process of analysis of the organizational work normally involved and necessary for PFA's.

This process of analysis consists of eight steps, viz:

- (1) Breakdown of activities into individual tasks;
- (2) assignment of functions inherent in each task;
- (3) indication of the organizational level at which each task is to be performed and the level at which the functions for fulfilling these tasks are set;
- (4) determination of methods, techniques, implements and information necessary for executing the tasks;
- (5) establishment of sequences (with deadlines) for performance;
- (6) determination of know-how required by the staff for the execution of tasks and for the various functions implicit in execution;
- (7) setting the chain of command and control; and
- (8) analysis of the type of organization.

The breakdown of activities into separate tasks gives a better general idea of their magnitude and of details; it is also recommendable in order to identify link-ups and inter-relations between various tasks.

Functions are assigned in response to the questions: Who makes decisions? Who co-operates? Who executes tasks or subtasks? Who checks on performance?

Then, tasks have to be assigned at different levels, from the upper or highest level (the forest service, upper-echelon staff, the President's office, etc.) to the middle-echelon (regional offices) and the lowest ranks (local or area offices). Apart from this, organic units have to be identified where tasks are aggregated, namely the sub-departments, the sections, sub-sections or units, and so forth.

In addition, it is necessary to know what options are open as regards methods, techniques and implements or means for the accomplishment of tasks, as well as the criteria or norms for their selection. The assignment of tasks and subtasks, and decisions regarding techniques to be utilised, implicitly calls for decisions as to sequence of individual or piecemeal jobs, their connections and link-ups as well as the dates or deadlines for the completion of each task.

Furthermore, responsible staff must be found with proper qualifications (professional preparation, special education, personal qualification, etc.) for the performance of the corresponding tasks.

Once it is determined that each task is being properly performed there must be a clear aggregation of functions (for decision-making, cooperation, etc.) for each task and subtask. The ideal result of all this should be a continuous chain of command and control.

The basis for analysis of the type of organization is derived from the findings in these eight steps, and especially from the solutions adopted for: (1) breakdown of activities into tasks; (2) assignment of functions to units; (3) assignment of functions by levels; (6) manpower qualification; and (7) determination of the chain of command.

1.3 Types of Organization

Four types of organization can be distinguished:

- line organization;
- staff-and-line organization;
- collegiate organization;
- functional organization.

In a line organization the head of each unit makes all the decisions (which other persons implement and execute) and supervises execution. The advantages of this type of organization are clear assignment of responsibilities and, in general, rapid performance. The disadvantages are: possible overloading of the chief with work; scarcity of special skills and knowledge; lack of direction in case the chief is ill or absent; and a break in continuity in case the chief is transferred. For that reason this type of organization is good only for the lower organizational levels (e.g. in forest districts). It is also advisable that the head of a staff unit be assured a minimum of office tenure and that complete and full documentation on all background, experiences and results achieved be available for use by his successor.

In the staff-and-line organization, the head has under him one or several teams of specialists who act as his advisers and prepare decisions for him, each from the standpoint of their own specialties. Responsibility for decision-making still rests clearly upon the chief in order to maintain a clear chain of command. Normally the specialists have no command over lower-echelon staff. Only in special circumstances may the chief permit a specialist to give direct orders to lower-echelon staff. Of course, the specialist does have command over his subordinates in his own unit, whether this be a section or subsection, etc. The advantages of this type of organization are: relieving the chiefs of the respective offices of some workload in the preparation of decisions, the positive influence of specialists offering their expertise, and greater continuity in management. All this must be weighed against possible disadvantages: sometimes it slows down decision-making, or the specialists or experts may fall into the temptation of exercising direct command over line offices - all drawbacks which can easily be avoided.

In the collegiate type of organization, a board of directors has much the same authority as the director-general. Decisions and orders are the results of mutual consultation; the director-general or chairman is merely acting as spokesman for the board. Decisions may be well thought out, but as a rule decision-making takes time and in crucial matters it is not clear where responsibility lies.

In a functional organization the heads of departments or sections (production, forest industries, protection, wildlife, etc.) assume command in specific fields, each according to his own specialty. They make decisions and issue commands within specified restrictions. The advantage of this type of organization is that the workload of the chief is lightened to a greater extent than in a staff-and-line organization and as a rule all procedure is expedited. The principal drawback is a possible lack of coordination between the different departments so that there may be overlapping or even contradiction in orders, creating conflicts in execution. To some extent it is possible to eliminate this disadvantage by making communication between the various departments mandatory. Another disadvantage is the greater likelihood that department chiefs exceed the jurisdiction or area of their competence; for that reason it is necessary to define very clearly and rigidly the restrictions placed on them.

In Latin America all these types of organization are found except for the collegiate type. At the central level of the PFA's (whether they be called in Spanish 'Subsecretaría', 'Dirección General', 'Dirección', 'Gerencia' or 'Presidencia' (as in the IFONA of Argentina, the IBDF of Brazil) the staff-and-line organization is in use. At times there is a tendency at that level towards functional organization (Ecuador, Honduras, Mexico). At the regional level the organization is very often of the staff-and-line type (for instance, Chile and Peru). In Mexico, at the regional level, there is sometimes only one forest inspector, that is to say a line organization; the same situation occurs in some States of Brazil, where there is only one IBDF agent. At the regional level in Colombia (INDERENA), the set-up is reminiscent of the functional organization, because the forest agents are on the staff of an office also concerned with agriculture. At the local level (in the forest district or the forest unit, etc.) logically line organization is used.

1.4 Description of Functions and Activities

A clear and general understanding of the manner of organization and assignment of functions and activities, diversification of competence and formation of units is indispensable for the efficient functioning of an administration with such wide geographical coverage and such complex functions as those of a PFA. Accordingly it is necessary to have a clear picture of the procedure in each unit and for each post.

There are several ways of presenting the procedure: either in a descriptive form, through graphs and/or synopses, or by numerical programmes and forms.

The descriptive form expresses verbally the tasks, responsibilities under normal and exceptional circumstances, the interrelations, liaison and communications between the various units, the techniques to be applied according to conditions, etc. Instances of this descriptive form are found in the PFA's throughout Latin America: internal rules of procedure, administrative manuals for organizational procedures and technical manuals for execution, including instructions for the proper use of machinery, instruments, computers and tools, etc.^{1/} The descriptions of the various posts in the organization also illustrate this manner of description. This lends itself very well to the explanation of appropriate work under various circumstances, exceptions thereto, and of details of links and restrictions.

Organizational charts, flow diagrams and diagrams of functions are instances of graphic and/or synoptic presentation. This form gives an overall view and helps identify the chain of command and control, as well as sequences of tasks and manner of association of persons (for instance the flow diagram). Still, the graphic presentation is a simplified form that does not explain exceptions nor does it show how execution has to be fitted to circumstances. For this reason descriptive and graphic presentations complement each other.

Among numerical programmes, computer programming is coming more and more into use, since it can provide widely varied information. Its schematic outline shows the sources of information and links between units. Arithmetical operations and the corresponding sequences illustrate partial aspects of organization. It is also possible to develop formal systems of information (for computerization) in order to improve execution from the organizational standpoint, as for instance information systems having to do with forest management or staff administration. An efficient supplement or substitute for administrative and technical regulations is the so-called PERT System (Programme Evaluation and Review Techniques) which shows the logical sequences and connections as well as deadlines for the completion of partial tasks in a whole aggregate of tasks. Another numerical type of programme is simulation, on the basis of which administrative and technical decisions can be

Among the many instances we mention two of the most recent, namely the "Descripción funciones para los puestos de profesionales de la Dirección de Desarrollo Forestal" (Description of functions for professional posts in the Forest Service) of Ecuador (March 1975) and the "Normas e instrucciones técnicas y administrativas para la operación de los Distritos Forestales" (Norms and technical and administrative instructions for the forest districts) of Paraguay (19 July 1975).

reached in accordance with certain presumed conditions, thus anticipating administrative processes. For the time being, however, such simulation systems are not commonly used.

Finally, forms are another means of presenting functions and activities in planning, execution and control work. The structure of such forms, as well as the instructions for completing them, show a certain aspect or portion of the organization, knowledge about which may lead to the collation of information reflected therein and may serve the purpose of rationalizing administrative work.

2. PLACE IN THE PUBLIC ADMINISTRATION AND INTERRELATIONS

As described in the powers, functions and activities examined above, the PFA's of all countries are expected to meet fundamental needs that can be summed up as follows: (a) developing and implementing of unified forest policy; (b) assuming a certain degree of governing authority; (c) taking a minimum amount of the initiative and exhibiting the flexibility ordinarily ascribed to private enterprise; (d) being capable of operating at a high level of executive deconcentration; and (e) taking part in integrated or concerted activities, mainly at the national and regional planning level, in land use, in production and in the processing of raw materials derived from forests.

Such requirements govern not only the internal organizational features of the PFA's, but also their fitting into the public administration system as a whole, as well as their interaction and interrelationship with other bodies and institutions.

2.1 Place in the Public Administration

In an FAO document^{1/} the main ways for placing the PFA's in the state machinery were described in general terms, with their respective advantages and drawbacks, namely: (a) as part of a ministry; (b) as a separate ministry for forests and forest industries; (c) as a public forest authority or corporation; and (d) as being attributed a certain autonomy within the civil service. In Latin America the type (a) above was practically the only one existing up to 1967 and is still the most common form at present. During the past eight years, however, six countries have introduced type (d) and two others type (c). Thus far there is no instance in this region of any Ministry of Forests and Forest Industries, the solution applied in several countries of Eastern Europe and West Africa.

In FIGURE 9 the current institutional set-up of 25 PFA's in Latin America is shown from the standpoint of their place in the government. The first criterion adopted for this classification is whether the PFA is autonomous or not, since this feature of autonomy has become of key significance among the innovations recently introduced in Latin America with regard to the placement and organization of PFA's in the government machinery. In decreasing order of importance, other classification criteria have been adopted, namely: whether or not the national civil service is organized as a federal or a unitary body; whether the PFA belongs to the Ministry of Agriculture or some other ministry; and the rank and administrative level of the PFA.

Turning once again to the fundamental requirements that all PFA's must in some way meet, it can be stated that in the last few decades Latin American countries have as a rule satisfactorily met the requirements of a unified policy and of institutional rank, although there are still some instances of dispersed public authority in the field of forestry, and some countries have no PFA at the desirable level. Still, the trend towards an unequivocal forest policy and the setting up of a PFA with recognized authority in each country has become quite clear in this region. For that reason the emphasis in efforts for reform or organizational set-up has moved towards the attainment of other requirements mentioned above, namely: initiative, flexibility, organizational deconcentration and concerted action. Without taking sides in favour of one or another set-up, whose advantages and disadvantages have

FIGURE 9

LATIN AMERICA:
TYPES OF PUBLIC FORESTRY ADMINISTRATIONS

1. AUTONOMOUS OR SEMI-AUTONOMOUS PFA's

1.1 In countries with federal governments

1.1.1 Brazil (IBDF and state services)

1.1.2 Argentina (IFONA and provincial services)

1.2 In countries with state governments

1.2.1 Centralized state body: Cuba - INDAF

1.2.2 Decentralized state bodies

1.2.2.1 Bolivia - CEDEFOR

1.2.2.2 Colombia - INDERENA

1.2.2.3 Guatemala - INAFOR

1.2.3 Public law authority: Honduras - COHDEFOR

1.2.4 Private law authority: Chile - CONAF

2. INTEGRATED PFA's

2.1 In countries with federal governments

2.1.1 Mexico (under the Secretaria de Agricultura y Ganaderia)

2.1.2 Venezuela (under the Ministerio de Agricultura y Cría)

2.2 In countries with state governments

2.2.1 Under the Ministry of Agriculture (or a similar agency)

2.2.1.1 With the rank of a Forest Department (or a similar department)

2.2.1.1.1 Costa Rica

2.2.1.1.2 Ecuador

2.2.1.1.3 Jamaica

2.2.1.1.4 Paraguay

2.2.1.1.5 Peru

2.2.1.1.6 Trinidad and Tobago

2.2.1.1.7 Uruguay

2.2.1.2 With the rank of a department of renewable natural resources
or a similar department having a forestry section among its units

2.2.1.2.1 El Salvador

2.2.1.2.2 Haiti

2.2.1.2.3 Nicaragua

2.2.1.2.4 Panama

.../...

(Fig.9, continued)

2.2.2 Under a ministry (other than agriculture)

2.2.2.1 Belize (Ministry of Trade, Industry, Cooperation and Consumer Protection)

2.2.2.2 Guyana (Ministry of Energy and Natural Resources)

2.2.2.3 Dominican Republic (Secretaría de Estado de las Fuerzas Armadas)

2.2.2.4 Surinam (Ministry of Development)

- N.B.:**
- COLOMBIA** - The Corporación Autónoma del Valle del Cauca, within the area of its jurisdiction, is endowed with the competence and functions corresponding to those of INDERENA in the rest of the country. There are 11 other public authorities (corporaciones) with greater or lesser autonomy doing forestry development work.
 - CHILE** - The "active members" of CONAF and the Corporaciones de Fomento de la Producción y de Reforma Agraria are state services.
 - MEXICO** - Each of the federated states has its forest commission. In addition there are 10 decentralized bodies (semi-governmental forest agencies).
 - VENEZUELA** - The Corporación Venezolana de Guayana and the Corporación de los Andes collaborate with the PFA.
 - NICARAGUA** - The Instituto de Fomento Nacional (INFONAC) works in the Atlantic zone. The establishment of an Institute for Renewable Natural Resources (Instituto de Recursos Naturales Renovables) (IRENA) is under study.
 - GUATEMALA** - The national forests of Petén (35,000 km²) are administered by the Empresa de Fomento y Desarrollo Económico del Petén (FYDEP) (Economic Development and Promotion Agency for Petén). The creation of an Instituto de Recursos Naturales Renovables (IRENA) is under study.
-

to be judged by each country in the light of its circumstances, it seems clear that the main recent reforms in various PFA's of Latin America (the establishment of autonomous PFA's in the form of either "institutes", "centres" or "corporations") must be interpreted in this

The autonomy or semi-autonomy of a PFA is not merely structural but is normally achieved at top level through a decision-making board ('Directorio', 'Junta', or 'Consejo Directivo'), including in its membership ex officio members (government ministers). The PFA's are under the jurisdiction, or "area of responsibility", of some ministry, usually the Ministry of Agriculture. Given the importance and newness of this type of set-up, FIGURE 10 has been drawn up to show the main features of the eight PFA's of this type in Latin America at

Naturally, restructuration intended to impart greater or lesser autonomy to PFA's has not been the only change. New PFA's have been set up using the approach of an integrated public administration (Paraguay), or else the administrative rank of certain agencies has been raised (Bouvier and Venezuela) and a trend, the outcome of which is still unknown, has come into being in several PFA's towards assuming wider responsibilities in the administration of renewable natural resources (as in Nicaragua and Guatemala).

FIGURE 10

LATIN AMERICA: AUTONOMOUS PUBLIC FORESTRY ADMINISTRATIONS

Name and instrument by which created	INSTITUTIONAL TYPE	LEGAL STATUS	HIGHER ORGANS	MAIN PURPOSE
BRAZIL - Instituto Brasileiro de Desenvolvimento Florestal (IBDF) (Brazilian Institute for Forestry Development) Decree-Law No. 289 of 28 February 1967	Independent body of the decentralized administration of the Ministry of Agriculture	Legal personality and with independent means	- The <u>Chairman</u> appointed by the President of the Republic on the nomination of the Ministry of Agriculture - <u>Forest Policy Commission</u>	Formulation of forest policy and implementation plans; inventorying of forest resources; research on forests, wood and wildlife; promotion and conduct of reforestation work; laying down rules and regulations for forest industries; enforcement of laws governing renewable natural resources.
CUBA - Instituto Nacional de Desarrollo y Aprovechamiento Forestales (INDAF) (National Institute for Forest Development and Lumbering) Law No. 1204 of 27 April 1967	Central body under the direction of the Consejo de Ministros (Council of Ministers)		- <u>Chairman</u> appointed by the President of the Republic and the Prime Minister	Preparation and execution of forestry development plans and programmes; in charge of lumbering, sawmilling, timber storage and distribution; in charge of wildlife conservation and development; responsibility for setting aside of nature reserves; responsibility for raising of forest consciousness among the population.
COLOMBIA - Instituto de Desarrollo de los Recursos Naturales (INDERNA) (Institute for Development of Renewable Natural Resources) Decree No. 2420 of 24 September 1968	Public agency, administratively autonomous, under the Ministry of Agriculture	Legal personality with its own assets	- <u>Junta Directiva</u> (Board of Directors) - <u>Gerente General</u> (Director-General)	Regulation, administration, conservation and development of natural resources, including maritime and river fisheries, surface and groundwaters, soils, forests, wild flora and fauna, national parks, river networks, natural resources, communal savanna and national grasslands; responsibility for enforcement of laws governing renewable natural resources.

.../...

(Fig.10, continued)

Name and instrument by which created	INSTITUTIONAL TYPE	LEGAL STATUS	HIGHER ORGANS	MAIN PURPOSE
CHILE - Corporación Nacional Forestal (CONAF) (National Forest Authority) Decree No. 455 (Ministry of Justice) of 19 April 1973	A public authority headed by the Minister of Agriculture and consisting of administrative units	A private law corporation with legal personality & assets, governed by its own Statutes and the Civil Code	- <u>Presidente</u> (Minister of Agriculture) - <u>Consejo Directivo</u>, which includes representatives of active members of CONAF - <u>Director Ejecutivo</u>, appointed jointly by the Minister of Agriculture & the Vice-President of CONAF	Responsibility for the contribution to conservation, development, management and utilization of forest resources; for participation in the framing and execution of development plans for public domain forests; for the management and working of forests; for reforestation, law enforcement, manpower training, and infrastructure-building for forestry development.
ARGENTINA - Instituto Forestal Nacional (IFONA) (National Forest Institute) Law No. 20.531 of 30 August 1973	Independent agency of the Government under the Ministry for Economy		- <u>Consejo de Administración</u> presided over by the Director-General - <u>Comisión Nacional de Bosques</u> (National Forestry Commission) composed of delegates from the provinces that adhere to the forest regime, & agencies and groups connected with forestry administrations - <u>Director-General</u>	Full responsibility for the enforcement of the Law for Protection of Forest Resources and by-laws; administration of the forest fund; inventorying, research, protection and improvement of forests; management of forest land belonging to the Federal Government and to the provinces, municipalities and any independent bodies to which such land has been granted; proposal of measures pertaining to the forest industry and international trade in timber and other forest products.

.../...

(Fig. 10, continued)

Name and instrument by which created	INSTITUTIONAL TYPE	LEGAL STATUS	HIGHER ORGANS	MAIN PURPOSE
HONDURAS - Corporación Hondureña de Desarrollo Forestal (COHDEFOR) Decree-Law No. 103 of 10 January 1974	Semi-autonomous agency with full government backing	Legal personality with independent assets	- <u>Consejo Directivo</u> presided over by the Chief of State and including government ministers - <u>Gerente General</u> appointed by the Chief Executive	Responsibility for the State's forest policy; administration of State forests; protection, improvement, expansion and optimum utilization of forest resources that generate funds to finance development programmes; industrial processing and marketing of forest products.
GUATEMALA - Instituto Nacional Forestal (INAFOR) Decree No. 51-74 of 6 June 1974	Decentralized, semi-autonomous state agency under the Ministry of Agriculture	Legal personality, independent assets, ability to acquire title and to assume obligations	- <u>Junta Directiva</u> (including government ministers) - <u>Gerente General</u> appointed by the Junta Directiva	Responsibility for unifying existing forest agencies, inventorying the nation's forest resources, optimum utilization of forest resources, conservation and restoration of renewable natural resources; promotion of forest development and forest industries; enforcement of forest laws.
BOLIVIA - Centro de Desarrollo Forestal (CENDEFOR) Decree-Law No. 11686 of 13 August 1974	Decentralized agency under the jurisdiction of the Ministerio de Asunto Campesinos y Agropecuarios with administrative autonomy	Legal personality with independent funds	- <u>Directorio</u> (Board) which includes government ministers - <u>Consejo Consultivo</u> (Council) - <u>Director-General</u> appointed by the Minister of A.C. and A.	Responsibility for framing forest policy and implementation plans; administration of the nation's forest resources; enforcement of forest laws; promotion and laying down of rules and regulations for the establishment of forest industries; administration of national parks.

2.2 Interrelations

As pointed out in speaking of cooperation, PFA's, aside from certain relations of authority and jurisdiction that determine their place within the general public administration, have a wide range of links with other agencies or institutions of the most varied character. Some connections are essential in any public machinery, such as those with the Ministries of Finance or the Comptroller-General's Office; it is well to mention them here if they are of recent origin or are still in the process of formation, as is usually the case with planning bodies. Other ties are attributable to specific activities which tend to become diversified and to grow as the PFA's develop and gain in prestige. Due to the information received on this point in the replies to the National Questionnaire it was possible to classify the main kinds of links of PFA's under the nine following headings:

- (a) Interrelations with planning agencies. - These are of great importance in many countries, as indicated in Chapter V, and are mentioned in most national reports, sometimes with reference to an agency at the sectoral level (such as the Oficina Sectorial de Planificación Agraria (Agricultural Sector Planning Office) of Peru) and sometimes with reference to the top planning agency (viz: the Junta Nacional de Planificación (National Planning Board) of Ecuador).
- (b) Liaison with the national civil service. - As has been seen, PFA's are usually located in ministries (as a rule the Ministry of Agriculture) or, if they are autonomous, are attached thereto. Much of their work ties in with that of the ministry and comes within its sphere of responsibility: land settlement, land reform, extension work, etc. There is also liaison between PFA's and a number of official agencies and branches of offices that, whatever their names in the various countries, function at the national level in industry, domestic and foreign trade, public works, education and government. The reports also mention, though less frequently, liaison with other departments, viz: tourism, national defence and foreign affairs.
- (c) Liaison with local administrations. - In a country with a federal constitution the PFA consists of the forest service of the national government, together with their matching agencies in the federated states (as, for instance, the Provincial Forest Services in Argentina). Aside from this, the PFA's of many countries (Honduras, Mexico and Uruguay) maintain active relations with municipalities, particularly if the latter own forests ('ejidos', for instance). In countries with centralized governments there is also liaison between PFA's and provinces or departments (as in Colombia), as well as with multisectoral regional offices (as in Chile).
- (d) Liaison with governmental or semi-governmental agencies or enterprises. - Such liaison is already of utmost importance in certain countries like Colombia and Mexico, and it seems will become so in several others like Argentina, Bolivia and Honduras. In Colombia there are 12 forestry corporations functioning as mixed economy corporations coordinating their work with INDERENA. Mexico has 10 semi-governmental forestry enterprises that can be described from one of the most recent, namely the "Forestal Vicente Guerrero" set up in 1972 for lumbering in the State of Guerrero. The Federal Government allocates funds to it and it may incorporate any profits it earns by its own enterprise, as well as any capital invested by other semi-governmental or private companies and profits that ejidos, communities and private parties earn from their participation.

- (e) Liaison with development and credit agencies. - Many PFA's have active liaison with development banks (as do Argentina and Paraguay) or with funds, like the Fondo Nacional de Fomento Ejidal (National Ejido Development Fund) (Mexico) and with central banks (Costa Rica) and similar bodies which as a rule not only extend credit lines for forestry but usually also maintain development, extension, support and supervisory agencies.
- (f) Liaison with educational and research institutions. - PFA's almost without exception cooperate with all forestry research and educational institutes in the country, if the latter are not already part of the PFA itself (see Chapter IV). Such cooperation is not confined to that with forestry faculties, but extends to other colleges or faculties that offer courses in any field of forestry or related fields as well as with secondary and vocational schools. The cooperation of PFA's with forestry faculties normally includes research work, but PFA's also collaborate with centres like the Instituto Centroamericano de Investigación y Tecnología Industrial (Central American Industrial Technology and Research Institute) (Guatemala), the National Scientific Research Council (Guyana) and the Instituto Forestal Latinoamericano de Investigación y Capacitación (IFLAIC) (Latin American Forestry Research and Training Institute) (Venezuela) (see Chapter VI).
- (g) Liaison with professional foresters' associations. - Professional foresters' associations in Latin America that are known to us are listed in Chapter IV. Some of these associations are very influential, have a long history and, together with more recently created ones, have shown great dynamism in collaborating with the relevant PFA's in matters of public interest such as the framing of forest policy.
- (h) Liaison with non-profit-making bodies. - Into this category falls the liaison that many PFA's maintain with associations such as the Asociación de Amigos de la Tierra (Friends-of-the-Land Association), the Asociación Ecológica Salvadoreña (El Salvador Ecology Association) (El Salvador), the Asociación de Amigos del Bosque (Friends-of-the-Forest Association) (Guatemala), and other similar groups generally dedicated to protection of the environment and of renewable natural resources, which are particularly active in certain countries, namely Argentina, Colombia and Venezuela.
- (i) Liaison with private economic societies. - Such liaison of the PFA's is extremely important in many countries. We may cite as an example the Cámara de Empresarios de la Madera y Afines (Chamber of Timber and Allied Products Enterprises) and other similar bodies in Argentina, the Asociación de Industriales de la Madera (Association of Timber Industrialists) of Costa Rica, the Federación Paraguaya de Madereros (Paraguayan Federation of Timber Producers), the Cámara Nacional de las Industrias Derivadas de la Silvicultura (National Chamber of Forestry-Allied Industries) in Mexico, and the Asociación de Productores de Madera (Timber Producers' Association) in El Salvador.

3.

The structure of PFA's shown in the organizational charts and explanatory notes submitted by the various countries in reply to the National Questionnaire will be the basis for the analysis of this subject. In most Latin American countries with well structured PFA's, these are usually organized at three levels: central, regional and local. In the case of integrated PFA's, the central level (Headquarters) is usually a General Directorate or in other cases a Directorate or Under-Secretariat of a ministry, usually the Ministry of Agriculture. In the case of autonomous or semi-autonomous PFA's, the Headquarters is called "Presidencia" (President's Office) or "Gerencia General" (General Manager's Office) (as in Argentina, Brazil and Honduras). The regional level pertains to the provinces, states or regions, or to administrative districts. Sometimes there is no regional level and it

coincides with the local level (as in El Salvador and Uruguay). The local level may have different names; usually it is called a "distrito" (district) (Ecuador, Paraguay, etc.), but it may also be termed "área", as in Chile, "proyecto" or "unidad de manejo" (management unit). Here we shall mainly examine the central level of the PFA's and then their main links with agencies at other levels^{1/}.

3.1 The Central Level

3.1.1 Typical work and structure

At the central level there is the head of the PFA and the various specialized units which operate as his staff units or as functional units (compare with 1.3 of this chapter). These units are structures in a hierarchy of from two to four echelons within the HQ unit, i.e. the "Dirección", "Departamento", "Sección" or "Unidad".

The typical work at the national, central level includes:

- studying future prospects and developing accordingly an integrated forest policy and a strategy for achieving its objectives;
- drafting bills of law or updating old laws and rules and regulations governing the forest sector;
- participating in, and counselling on, all matters of procedure (plans, laws, changes in public administration) related to the use of the forest resources with a view to fostering socio-economic development;
- maintaining liaison with the forest industry sector and other allied sectors;
- setting goals for public relations and diffusion among the public of knowledge relating to forestry;
- developing a technical assistance organization for non-governmental forest owners;
- developing applied forestry research and participating therein;
- participating in the formulation of policies for continuing education and training in forestry;
- preparing directives and publishing manuals (rules and regulations) for the operation of the entire PFA and for supervising lower-level offices.

From an examination of the organizational charts and pertinent descriptions it appears that the central offices of the PFA's studied actually do work that may be termed either substantive or support work.

Substantive work is the most important and significant in relation to forest policy. This work can consist of activities which no other part of the public administration is in a position to carry out. Obviously there is no single definition of such work that is absolute and valid for all countries. One may distinguish between typical and supplementary substantive work. The latter may not fit in perfectly with the definition of substantive work given above.

Support work may not necessarily be incorporated in the PFA's; in other words, it is not typical for the work of the forestry sector. Obviously such services are just as necessary for PFA's as for any other branch of the public administration, viz: the agricultural sector, public works, etc.

1/ The term "Distrito Forestal" (forest district) in some cases refers to the regional level. In Honduras, for instance, the seven districts of CONDEFOR are authorized to plan at the regional level and it is intended to sub-divide them into sub-districts, regions and management units.

According to these definitions the work of PFA's may be classified as follows:

Substantive (typical) work

Forest production
Forest management
Forest protection and conservation

Substantive (supplementary) work

Wildlife (hunting and fishing) and national parks; recreation and tourism
Forest industries and timber marketing
Forest engineering and technology

Support work

Applied research
Information and public relations
Education, training and extension
Planning and programming
Administration

As regards substantive work it should be pointed out that in lieu of the term "producción forestal", other terms may be used in Spanish, namely "fomento" (development) (Argentina) or "aprovechamiento forestal" (forest utilization) (Costa Rica and Mexico). Despite these variations in terms, what is meant is virtually identical. Sometimes the term "forest production" is also used to cover non-timber products (Mexico) or marketing (Cuba).

By forest management is meant silviculture and silvicultural techniques, stand ment and, sometimes, planning (Surinam). In Paraguay, the department in charge of forest management is also responsible for national parks, wildlife and forest inventorying. In other cases certain activities of this department are also assigned to other departments or to technical units, viz: "forestación" (afforestation) (Guatemala).

In almost all countries, work that comes under the heading of forest conservation and protection is practically the same, namely: prevention and control of fire, pests and diseases; soil conservation (Colombia) and watershed protection (Chile, Colombia, Jamaica) and/or protection of natural resources in general; such general protection refers, for instance, to the forest land-use regime (Chile) or control over the clearing of forests for agricultural purposes (Venezuela). In some instances, protection of the environment is included (Colombia and Venezuela). In Colombia, national parks and wildlife come under the responsibility of the forest conservation and protection unit.

Work coming under the heading of wildlife and national parks includes: preservation of fauna and flora, the creation and management of national parks (El Salvador, Peru), hunting and fishing (Colombia, Costa Rica, Nicaragua) and recreation (Jamaica).

Support activities include:

- education and training;
- planning;
- information, research and public relations;
- organization and methods.

These will be dealt with in full in Chapters IV, V, VI and VII of this study. As for administrative support it can be said that the traditional components are: finance, budget, accountancy and audit, personnel affairs, documentation, registry, archives and special library services. These components are almost always part of the administrative machinery of the PFA's. Some countries (among them Colombia) have also an organization and methods (O+M) unit.

In some countries, the administration body includes less usual components; Bolivia, for instance, has a forest fund, El Salvador a forest concessions and forest protection unit, Chile a unit for sales and exports, Chile and Colombia a unit for rural welfare. Occasionally there are within this administration body, or in a specific unit, auxiliary services for legal counselling (Paraguay and Colombia), commodity storage, communications, etc. (Colombia). As an exception, Paraguay includes planning and administration among these auxiliary services.

3.1.2 Instances of structural solutions

As a first illustration, FIGURE 11 shows the internal organisation chart of the central offices of an integrated PFA, the Dirección General Forestal y de Fauna (General Directorate of Forestry and Wildlife) of Peru. In this case, production is handled in the Divisions of Forest Management and of Extraction and Forest Products. Stand management is in the hands of the Directorate of Forest Management, while forest industries and marketing of forest products come under the Division of Wood Extraction and Forest Products; forestry engineering and technology come under the subdivisions Stand Management and Reforestation; protection and conservation, as well as wildlife, are handled by the Conservation Division. There is a plan to set up a new research unit. Education and training do not appear in this organizational chart because this work is done at the University of La Molina, by CENCIRA, and by the National School of Public Administration. Programming and planning and other pertinent matters come under the offices of programming and administration; the latter office not only does administration work, but also provides support services. The offices of Asesoría Jurídica (Legal Counselling) and Estadística (Statistics) also provide support services.

Another illustration is that given in FIGURE 12 which shows the functional set-up of an autonomous PFA, namely the Gerencia de Bosques (Forest Management Office) of CONDEFOR Venezuela. In this case the work of technical support embraces two main areas, namely forest techniques and protection. The first includes control over land use, mapping and location of forests; tree stock assessment (inventorying); and economic and silvicultural treatment to secure sustained yield.

Forest protection involves organising fire prevention and fire-fighting systems, as well as pest and disease control. It also involves collection of seed, establishment of tree nurseries and promotion of natural regeneration of stands, planning for watershed management, control over shifting agriculture, and inculcation of the idea of multiple use in forest management.

Planning on how the public can benefit from the social function of the forests is done by a forestry extension unit through campaigns to raise public consciousness with regard to forests and their role, through encouragement of associations of forest workers and foresters, and through cooperatives for resin collection and committees for forest protection.

The production function consists in generating and controlling the production of raw materials for the local industry. This involves the conduct of a continuous price/cost analysis for raw materials, the costing of raw materials, purchases from private holdings and determining of cut, quantities, priorities, methods and techniques for forest utilisation, and exercising control and vigilance to ensure the fulfilment of purchasing and sales contracts.

In this instance too, the substantive tasks, both typical and supplementary, mentioned above are evident. In the case of a forest authority ("corporación"), the aspects of production and costing must receive special attention. It is worth noting that CONDEFOR considers the social function of forests as one of the most important, as is shown by the place assigned to this function in its organizational chart. It is also worth noting that

1/ Information derived in part from the FAO/IDB report on the forest project of Olancho.

FIGURE 11

PERU: ORGANIZATIONAL CHART OF THE DIRECCION GENERAL FORESTAL Y DE FAUNA (BIENNIUM 1975-76)

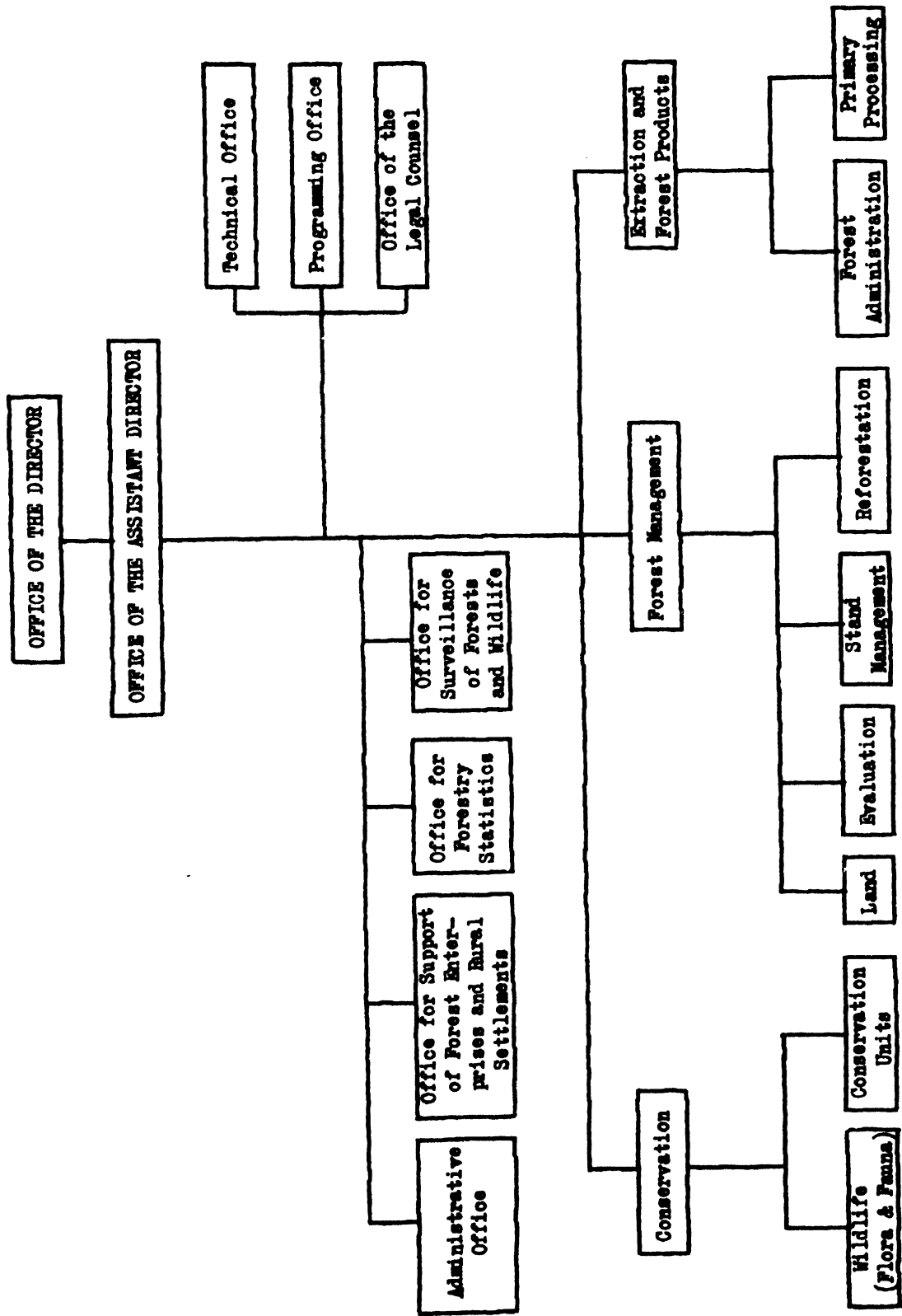
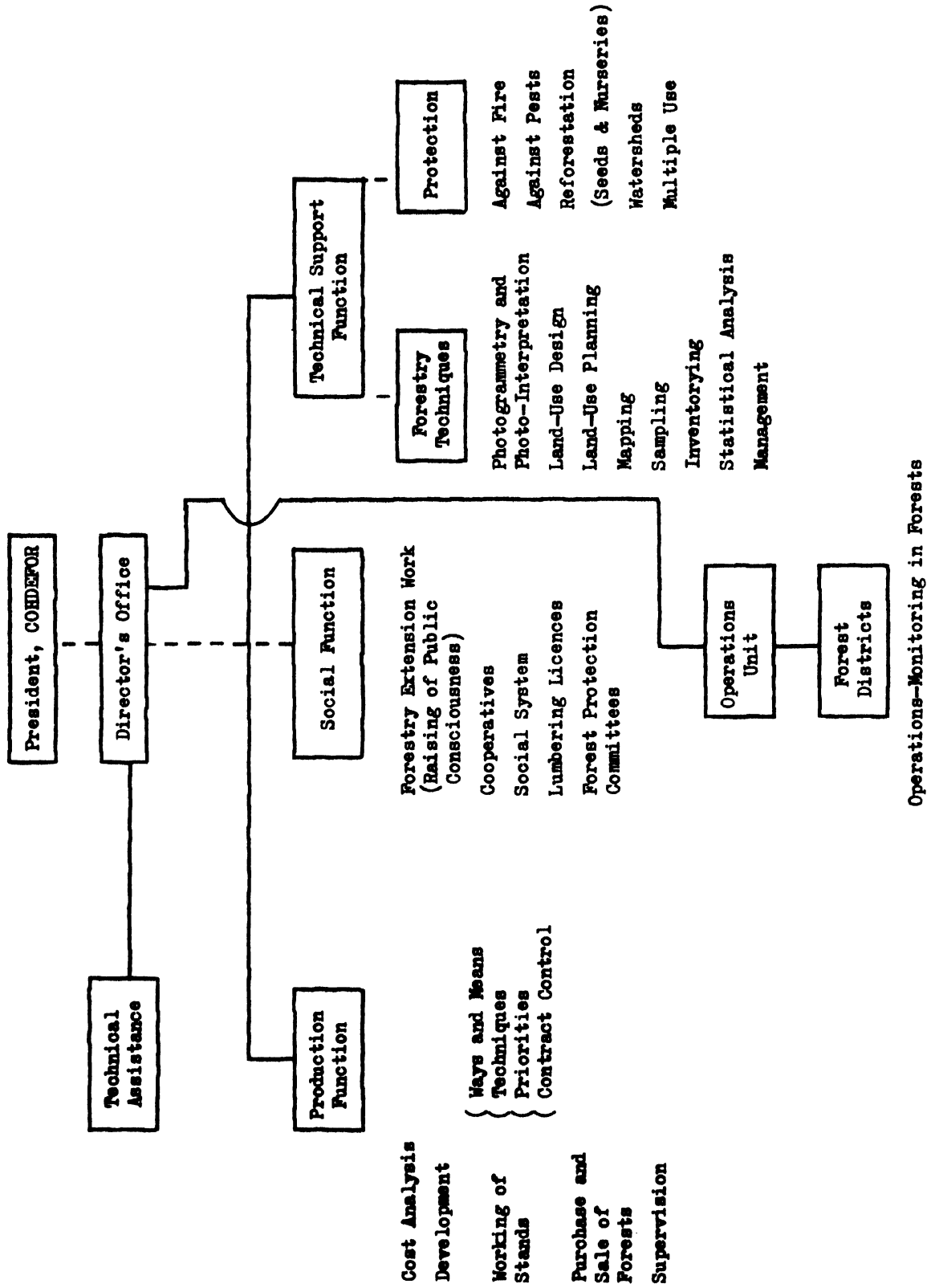


FIGURE 12
HONDURAS: FUNCTIONAL ORGANIZATION OF THE HONDURAN STATE AGENCY FOR FORESTRY DEVELOPMENT (COHDEFOR)



for more effective performance of field work an operations unit has been established right under its forest management office ("Gerencia de Bosques") which is directly responsible for direction, coordination and execution of work in the forest districts. This means that, despite the focus on functional organization, it was deemed desirable to emphasize in this way a staff-and-line type of liaison between the staff of the Director's Office and the field or district agencies, which appears to be a very good arrangement in a markedly operational organization, as is the case with COHEDFOR's Forest Management Office.

3.1.3 Consultative and decision-making collegiate organs

The consultative organs (councils, commissions or committees) are composed of members with expertise in certain sectors of public life or in certain specialities relating to the forestry sector. Certain members of these councils come from the PFA's themselves or from other parts of the civil service. Others represent sectors affected by decisions taken in the PFA's (private forest owners, forest industries, etc.). On the advice of these consultative bodies it is possible to broaden and check the information on the basis of which PFA's make their decisions. Furthermore, through these organs, the PFA's can evaluate the feasibility and the acceptability of their decisions. Instances of such consultative bodies are Colombia's councils or committees on forests, fisheries, watersheds, wildlife and national parks. Bolivia has both a consultative council and a technical council to advise the Director-General and the programming and coordination units; other similar examples occur in Jamaica (Consultative Forestry Development Committee of the Director of the PFA) and El Salvador (Technical Committee in the Head Office). Some countries also have regional-level councils. In the case of a federated country, like Argentina, a National Forestry Commission, in addition to advising, suggesting and proposing, also helps to ensure that national-level work is properly organized by having among its members a delegate from each province responsible for the enforcement of the Forest Resources Protection Law.

Consultative organs must not be confused with decision-making collegiate bodies or boards of many autonomous PFA's. For instance, INDERENA of Colombia and INAFOR of Guatemala have a Junta Directiva (Board of Directors); CONAF of Chile and COHDEFOR of Honduras have a Consejo Directivo (Directors' Council), while IFONA of Argentina has a "Consejo de Administración (Administrative Council) and CEDEFOR of Bolivia a "Directorio" (Directorate) (see FIGURE 10).

3.2 At the Regional Level

Work of the PFA's at the regional level must correspond to the objectives and strategies set at the central level, adjusting them in a manner that suits regional and local conditions. From this level it is possible to direct and supervise the execution of field work. That is why it is necessary to delegate decision-making to the regional level.

The main tasks at the regional (or zonal) level include:

- setting of goals and terms of reference for the implementation of national forest policy in the region (or zone);
- laying down of guidelines, analyzing, approving and checking on the execution of long-term plans (management plans) and annual programming at the local level for all districts, areas or individual enterprises, etc. in the region which is under the jurisdiction of the PFA;
- organizing and monitoring of the technical assistance system;
- coordinating of forestry plans with those of other sectors (region-wide planning);
- suggesting changes in staffing, administrative procedures, etc., with a view to enhancing the efficiency of the organization;
- preparing the regional budget and being responsible for financing.

The execution of this work requires some specialists or professionals whose specialties correspond in part to those of central office staff. That is why it is necessary at this level to have units analogous to those at the central level, although the regional ones are oriented more towards operational work. FIGURE 13 gives the organizational chart of the regional services of CONAF, Chile. In this case the technical, financial and administrative departments correspond to the same departments as the central level, and the sections of the regional departments correspond to those of the central office. This similarity between organic units at the central and regional levels facilitates communication and squarely places responsibility where it belongs.

3.3 At the Local Level

In order for any PFA to function well, to ensure correct and full implementation of forest policy and project a good image of the agency in the minds of the public, it is vital that competent staff be assigned in sufficient number to the local offices. As discussed in Chapter IV, much still needs to be done along these lines in all, or practically all, PFA's in Latin America.

The main tasks appropriate at the local level include:

- drafting of annual plans for all forest work in the form of integrated programmes in line with the regional forest policy;
- execution of approved plans or programmes in order to achieve the goals set;
- enforcement of obedience to laws and adherence to norms by concessionnaires and non-government forest owners;
- supplying of technical, economic and financial data for accountancy purposes;
- improving of forestry work in the light of analyses of previously attained results;
- updating and completing of inventories and compiling of information and factual data, incorporating results achieved;
- improving workers' conditions, including permanent on-the-job training.

4. STRUCTURAL OPTIONS AND MODELS

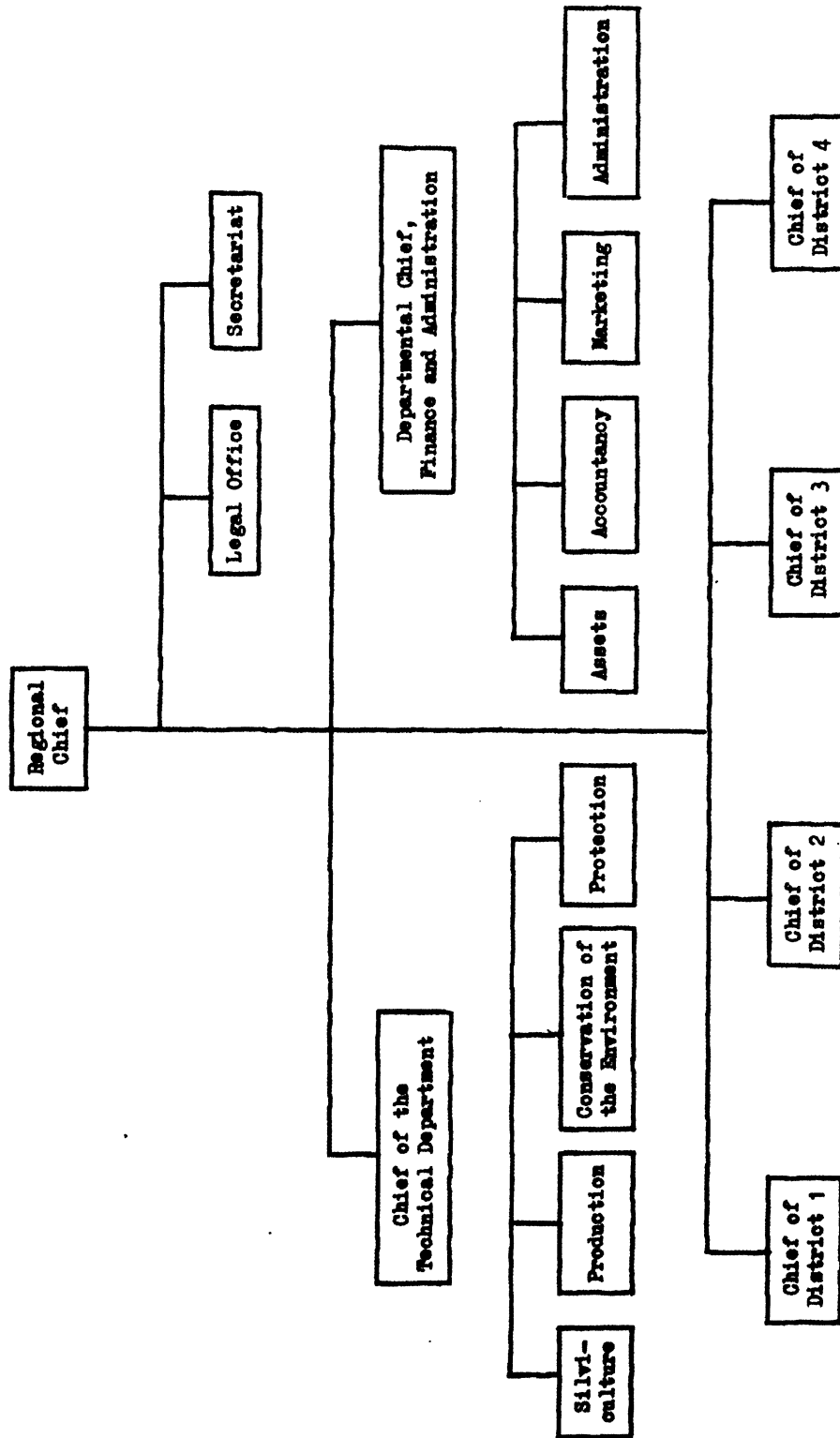
4.1 Conditioning Factors

What has been stated above regarding the organization of PFA's gives a good idea of the many variants that exist as to number of executive levels, the hierarchical set-up, assignment of functions, etc. Aside from these alternatives taken from actual examples, other possible options exist for which different models will be proposed below. But first of all it is necessary to analyze the principal factors affecting the choice among options as to structure.

Forest ownership, whether federal, state, communal or private, affects the balance between technical work executed by the PFA itself (management of state forests, for instance) and supervision or legal control over activities in private forests. In particular it affects the size of forest districts and the number and training of PFA staff. Similarly, the dispersion of forest holdings in a country and their size govern the density of the local administrative network and the intensity of control at higher levels.

The assignment of functions and duties also affects the organization, and especially the structure and formation of its units and consequently its staffing (number and type). It also affects liaison with other institutions or bodies. Much also depends on whether or not responsibilities for furnishing technical assistance to private forest owners, as well as for forestry research, education and training, watershed management, O+M, etc. are assigned to the PFA or not. In some instances certain responsibilities can be discharged through contracts or arrangements with other bodies - education, training and research, for

FIGURE 13
CHILE: ORGANIZATIONAL CHART OF THE REGIONAL OFFICES OF CONAF



instance. Peru's Oficina Nacional de Evaluación de Recursos Nacionales (ONERN) is the agency responsible for forest inventorying. Another example is the system of granting lumbering concessions in state-owned forests. In these cases the advantages of the savings on staff and means must be weighed against the disadvantages of losing direct control over activities.

Another significant point is the stage of advancement of the PFA. For historical reasons in Latin America, certain PFA's have been established only very recently, others are just developing and some are well developed; their structures differ accordingly.

In the case of one recently established PFA, most of the work is still centred at Headquarters; it has only small field offices and many of them only with a single officer. The central body handles almost everything, from laying down forest policy to field work. In this case work is necessarily concentrated in a few organic units, the heads of which have many diverse responsibilities (production, national parks, research, etc.).

The developing forest services delegate some of their functions to lower-level (usually regional) offices, but do not have enough field staff. Execution of work and control are carried out in part by the field offices. In addition there are more specialized organic units at the central level.

The already well developed administrations have staff at all necessary levels with greater diversification in the organic units of the central and regional offices. One typical consequence of the growth of PFA's is resistance to decentralization of functions and activities. This resistance is shown not only in the numerical deployment of staff at different levels, but also in the scarce delegation of authority to lower-ranking staff.

The number and capacity of available staff is a crucial factor in the structure of PFA's and is closely linked with their stage of development. In order to deconcentrate it is necessary to have experienced executive staff (professionals, technicians, vocationally-trained workers).

There are many alternative structures depending on the composition of the specialized units. Some specialization is necessary for the carrying out of activities as complex as those of a PFA. But there is a limit to the degree of specialization, namely the excessive sub-division of functions. Any excess in these not only entails overstaffing and is expensive, but also leads to overspecialization, with too many hierarchical levels in each unit, and favours centralization of authority, conflicts over duties or overlapping of work. This also occurs at the regional level whenever there too there are specialized units like those at the central level.

The structure of the PFA's in countries with a federal government depends on where authority is lodged, whether in the national government or in the federated states or provinces. Sometimes the federal set-up consists of two levels (the central government one and federal delegations to the states). The central government is responsible for forest policy and promulgates it with law-setting standards. It is at the state delegation level that the testing of the execution of work in the forests occurs to determine whether it conforms to these legal norms. A decentralization is possible here through delegation of control to state or provincial forest services which with their stronger field structure can do supervisory work more easily and efficiently. Such devolution of authority may be formalized by conventions or agreements (as in Argentina).

4.2 Structural Options

For regional offices of the PFA's there appear to be two main options: either their integration into the regional administration or their separation from it. If the state owns vast forest lands, separate regional branches of the PFA seem best, since these branches should function virtually as business enterprises on their own. Otherwise, that is to say where private forest holdings predominate, the PFA is mainly responsible for approving management plans, providing technical assistance, securing compliance with legal

obligations, and so forth. In such a case the PFA becomes essentially a control authority and it therefore seems best that it be integrated in the appropriate regional set-up of the civil service; it is recommended that the manner of its integration allow it to make use of means and resources already available to that administration in order to minimise costs. However, in such a case bureaucratization should be avoided and independence in technical decisions safeguarded.

Various structural options can be put forward, taking into account the scope of the control and the types of management.

Henri Fayol, in his famous book on administration^{1/}, investigated the problem of scope of control. He did experimental research to determine how many workmen a foreman could direct and supervise; how many foremen a technician could have under him, etc. What he was trying to do was to devise a rough numerical scheme for staffing with efficient control.

The numerical ratios derived by the Fayol method are not strictly applicable to all administrations, but show that a staff pyramid should be constructed on a broad base. If the scope of supervision is too narrow, there is overly strict control, which wastes the time of the supervisor, lowers the personal satisfaction of the staff and eliminates the incentive to work. At the other extreme, if the scope is too broad, control can only be superficial, so that it becomes impossible to catch errors, coordination is weakened and the influence of the chief on achievement of the goals is diminished.

At present the scope of most PFA's is too narrow and they are heavily centralized, especially at the national government level and sometimes even at the regional level. This has a ready explanation (need to strengthen forest policy and to ensure liaison with central institution; unfavourable living conditions in the field, etc.). Despite all this, efforts have been made towards deconcentration of staff, although with unconvincing results (see Chapter IV).

The type of management depends mainly on how decisions are made and how and to whom responsibility is delegated. There are two possible extremes in decision-making: the first is autocratic management, and the second is collegiate management. Autocratic management (a single person makes all decisions without consulting anyone) is good in times of emergency (fire, etc.) and is often applied at the local level if the forestry officer really has no one to consult. Autocratic management is not advisable at the highest levels, although it is sometimes resorted to because of diffidence or professional insecurity. The autocratic form of management at levels where the staff is highly qualified paralyzes initiatives and suffocates self-confidence of the staff. Furthermore, when the chief is away, work continuity is more or less suspended.

Collegiate management is based on democratic decision-making of a group of directors with a chief who is merely primus inter pares. Under this system, in cases of dissension or conflict of views, decisions are taken by a vote. This deliberative form of management is not usual in business enterprises nor in government, because many problems require quick decisions. Furthermore, it is important that a single person assume full responsibility for most decisions. In practice there are many variations between these two extremes. A very good solution at the highest levels is to have a general or headquarters staff, as more baseline data are available on which decisions can be made, and consequences of decisions in various sectors can be anticipated more accurately, although responsibility still falls on the chief alone.

Another criterion for deciding on the type of management is the extent to which responsibility is delegated. For certain important decisions it cannot be delegated at all, but

H. Fayol - "Administration industrielle et générale: prévoyance, organisation, commandement, coordination, contrôle". Dunod, Paris, 1925. First published in the bulletin of the Société de l'Industrie Minière, 1916.

there are many instances in which it can be delegated to subordinates in the same office or in lower-level offices. There are two main ways of delegating responsibility, namely: management by objectives and management by exceptions. In the first case the responsible person is well informed, through prior accord reached with his chief, as to the objectives to be attained both in quantitative and qualitative terms as well as regarding deadlines and available resources for attaining these goals. So he can decide upon the techniques and methods to be used within his area of responsibility and apply them without need for prior authorization.

Management by exception requires that responsibility and its limits be carefully defined. The person in charge may make decisions within these limits without any restrictions, needing only to consult or place the decision before his superior when some problem beyond his own terms of reference arises.

By availing themselves of these methods of delegation of responsibility, chiefs and supervisors can free themselves from dealing with minor details and concern themselves with major problems. Delegation of responsibility is absolutely essential for deconcentration purposes. It gives good results because through systematic deconcentration responsibility is spread over the entire staff, with consequent personal satisfaction, greater identification with the agency or institution, and greater dedication to work and hence better performance.

The requisites for considerable delegation of responsibility are:

- adequate planning (for operational purposes, indication of options, etc.);
- clear determination and delimitation of responsibility;
- an effective control system;
- good professional competence of staff;
- training and readiness of staff to assume responsibility.

Professional competence begins with schooling that should include training in decision-making, including practical work. In addition, on-going training in advanced methods is necessary, and it is recommended that the ability of officials to make decisions and shoulder responsibility be evaluated regularly. In order to induce staff to accept responsibility it is very important for the PFA's to provide a good, human personnel management based on equal treatment for all members of the staff, whatever their educational background.

4.3 Model Organizational Charts

Present-day PFA's are very diverse as regards organizational structure. So an obvious and quite justified question arises as to whether there is any one optimum organizational model. The truth is that there is no single optimum model that is universally applicable. National situations and problems differ so much that no one form of organization offers the answer to all.

Any specific solution has to be based on the conditions in individual countries and take into account external and internal circumstances that influence the structure. The diversity of influences affecting structure explains why it is not possible to devise any simple model organisation chart^{1/}. If an attempt is made here it is for purely heuristic reasons: the idea is to present certain basic models that can be useful in a discussion of this subject. Perhaps these models may fit actual conditions in certain cases, because, in so far as possible, they combine features already found in existing PFA's.

1/ In this case "model" means an abstract image that presents in a simplified form the main features of one part of reality and the internal relationships within that part.

The main influences that must be reflected in the organization of PFA's are the "conditioning factors" mentioned in Section 4.1 of this chapter. The features that have the greatest impact on the structure of these models are the three stages of development already defined: developed, developing, and young (incipient) PFA's. Since the structures of the young and "developing" PFA's are transitional, they must be so constructed as to be readily convertible at a later stage into the permanent "developed" structure.

Under each of these three types possible differences must also be examined, depending on whether the administrations are autonomous or integrated into the public administration. In addition to these three models of unitary PFA's, two models of federal PFA's are offered.

Model 1: A developed PFA (unitary)

FIGURE 14 shows Model 1.a with three levels (central, regional, local) and some indication of departments or support services.

FIGURE 15 gives Model 1.b with some details of the headquarters structure. Obviously, in the presentation of a structure at this level it does not matter whether the PFA is an integrated one or an autonomous one, but it is assumed that it is a highly developed one.

The terms of reference of the Director-General cover the entire forestry sector. It is recommended that he be advised by a council or board, especially for the framing of forest policy. In an autonomous PFA it seems even more essential than in the case of an integrated one that there be such a board, although a board is very useful in either case in order to make the maximum of information available and to be able to check on the feasibility of implementing the forest policy.

In order to cover all functions and activities of a PFA it seems best to create as many as six offices or departments (although there may be fewer), viz:

Production	- Research and Education
Forest Utilization	- Programming
Protection and Conservation	- Administration, including the Legal Counsel

Six departments are sufficient to make adequate control by the Director-General possible. This model also provides for committees to advise heads of departments. The degree of specialization is clear from the assignment of functions and duties among the divisions or sections in each department. Sometimes analogous activities are grouped in a single division in order to eliminate overlapping of similar work and excessive specialization. The number of higher-bracket general staff echelons can also be reduced. This does not mean that there cannot be several senior experts or specialists in each unit, but they will not all be chiefs of a unit but rather assistants to the chief. The number of such assistants should not exceed that required by major duties. Another reason for a maximum of six divisions is that of keeping a manageable scope of control. The model for such divisions applies to a country with vast tracts of forest land and a highly developed PFA. In a country with less forest land, some of these divisions can be combined.

When a PFA is a part of the general civil service it may at times share certain services. Those divisions or departments that lend themselves to being transferred to other parts of the public administration are marked in FIGURE 15 with asterisks. Normally, autonomous PFA's must have such units, but at times they may do without, provided there is an arrangement for lending of services.

At the central office, the appropriate type of organization is the staff-and-line one or else the functional type (the latter for very large countries).

In this model the regional office (in FIGURE 14) has only one consultative or advisory board and two departments. The board reflects regional requirements and is composed of representatives of forest owners and forest industry as well as other branches of the regional public administration. The technical departments embrace all matters involving

FIGURE 14

MODEL 1a : DEVELOPED PFA

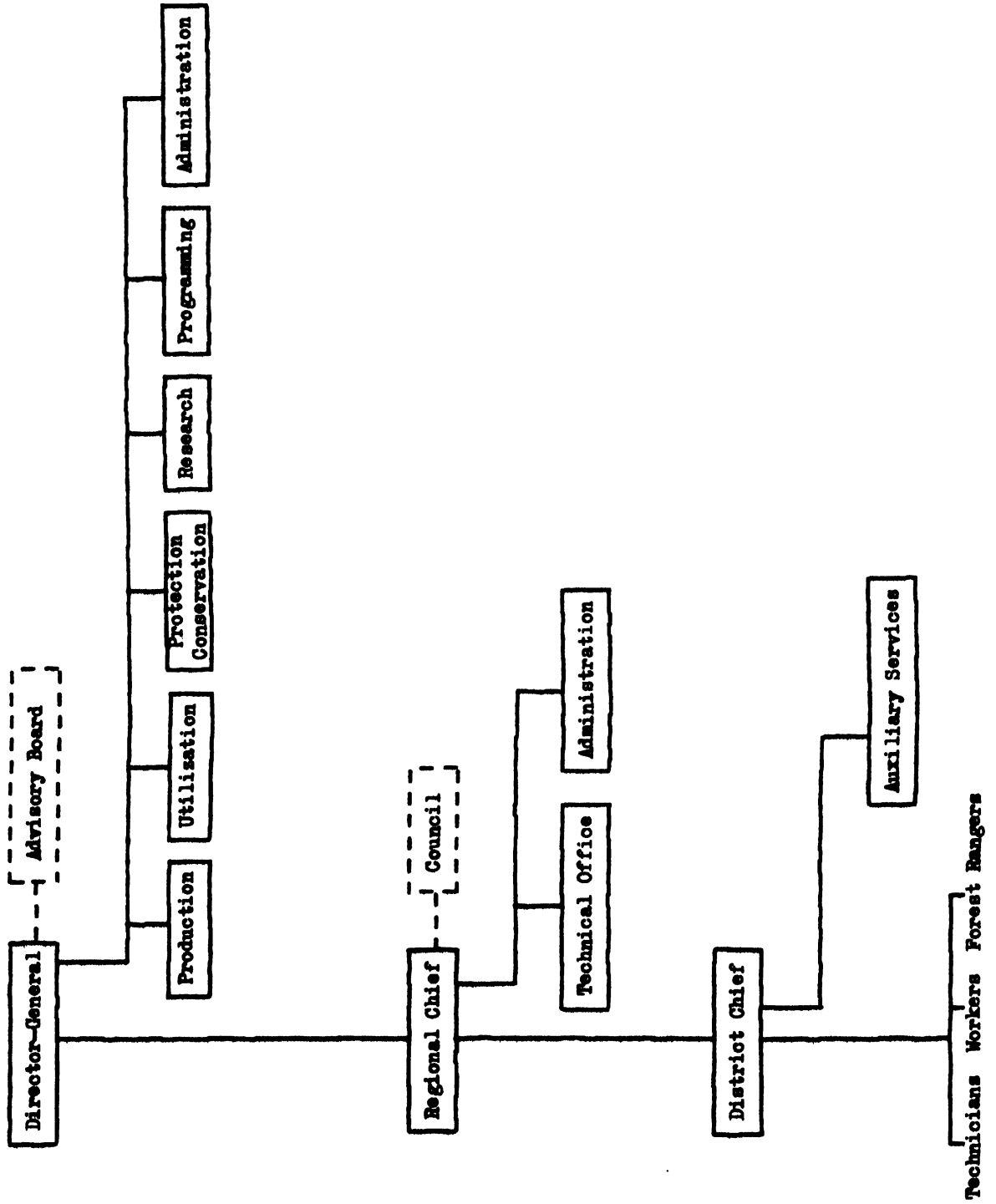
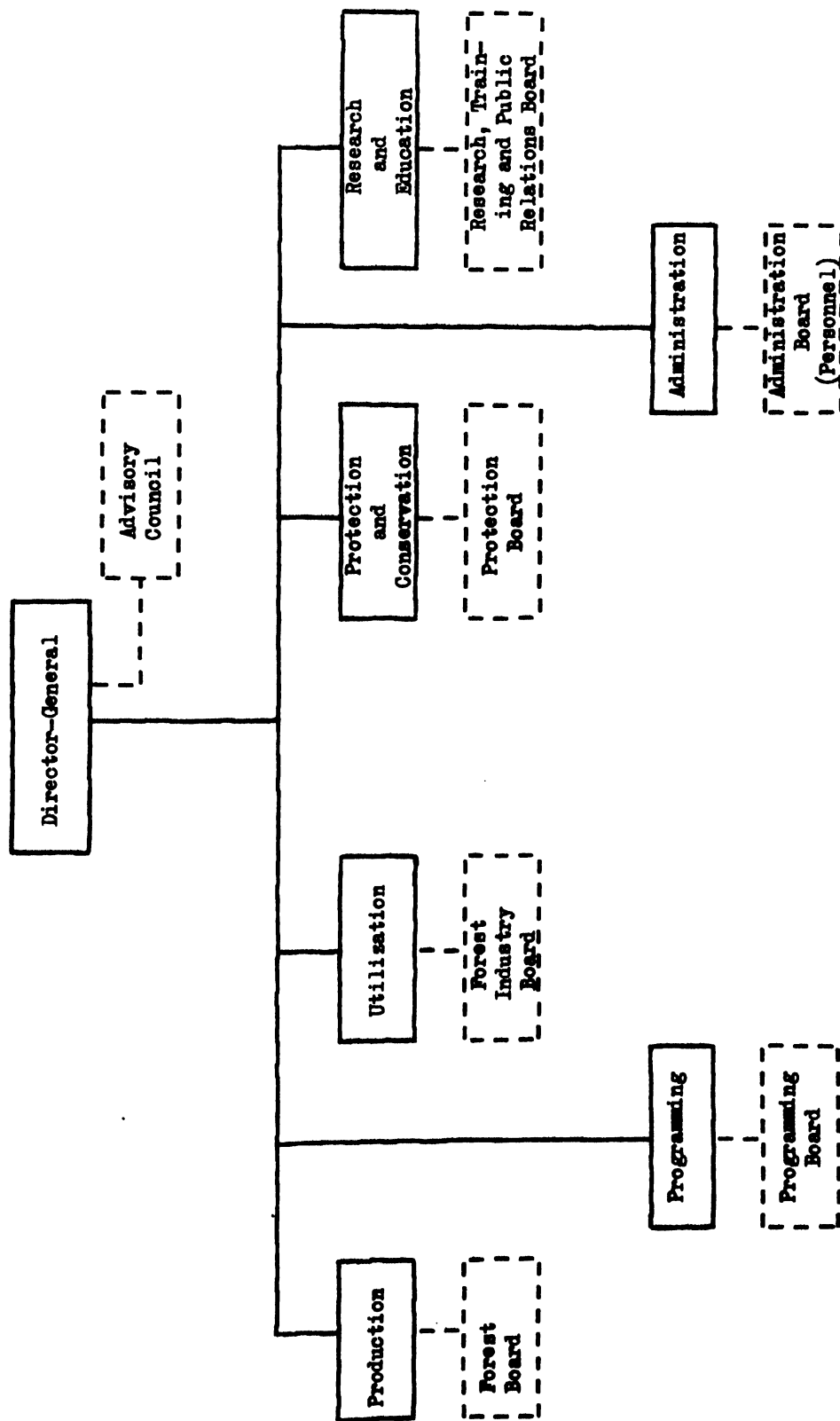


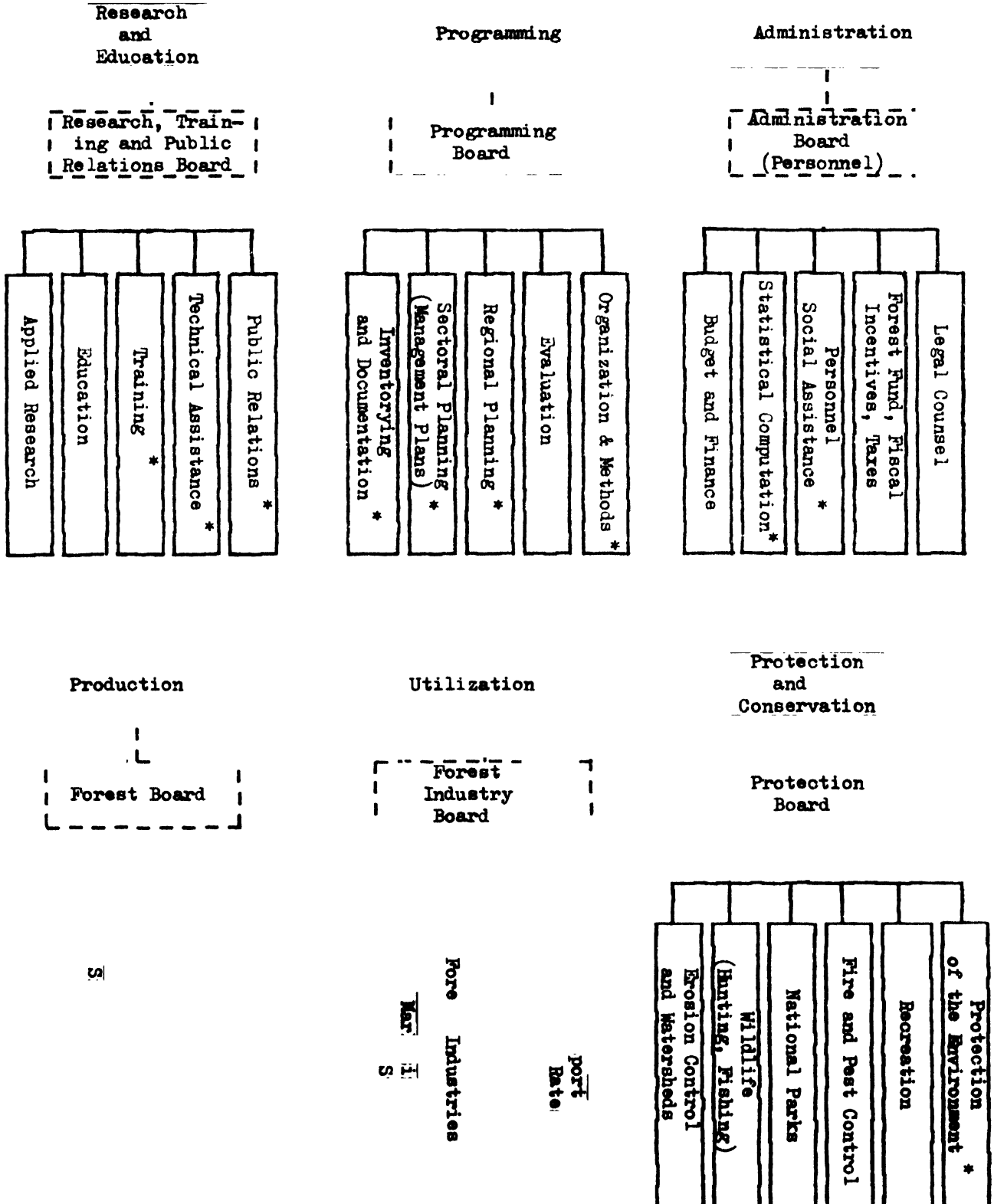
FIGURE 15

MODEL 1b: DEVELOPED PFA (headquarters structure)



.../...

(FIGURE 15, Model 1.b, continued)



production, lumbering, protection and conservation of forests corresponding to the respective central offices. Normally it suffices for the head of a regional technical office to have a maximum of three specialists, one each for the fields referred to, avoiding if possible the formation of sections in the technical department unless there is a great amount of work in the region in question. The regional office of a PFA is mainly responsible for budgeting and control over the use of the budget, finances, personnel and legal counseling. By special mandate it may also be placed in charge of public relations, project evaluation, etc. The handling of special affairs depends on whether the regional agency is autonomous or is part of the public regional administration.

The local office (whether district or area) normally consists of a chief and his staff (accountant, storage facilities, secretariat, etc.). The technicians, vocationally-trained workers and forest rangers or wardens work out in the field. In countries with very little forest land the PFA may consist of only two levels. In that case it would be advisable to eliminate the regional office and strengthen the local one, to which two small units might be added, one technical and the other administrative. The problem of control at the second, or local, level can be solved by having several inspectors or else having departmental chiefs from the central office (production, lumbering and/or protection) supervise one or two districts.

Model 2: A developing PFA (unitary)

FIGURE 16 shows Model 2, namely the central office of a developing PFA. In this case certain departments can be merged. The department for production combines the production and utilization offices of Model 1.b. The department for protection and conservation corresponds exactly to that in Model 1.b, although with some merging of divisions. The same is true of the administration department. The programming office includes the usual divisions plus the research and education office of Model 1.b.

As in Model 1.b, the divisions or departments are indicated which can be eliminated in the case of sharing of the services of the general administration (marked with asterisks).

The most appropriate type of organization for a developing PFA is the staff-and-line one and, as a second possibility, the functional organization. In case the latter is adopted, it would be advisable for the terms of reference of the chiefs of departments to be circumscribed.

For further details see explanations given for Model 1.b. Model 2, without further growth, is suitable for countries with little forest land.

In any case, a Model 2 PFA can easily grow into a Model 1 PFA through a splitting of divisions and departments.

Model 3: A young PFA (unitary)

FIGURE 17 shows Model 3, namely a central office of a young PFA with two departments, one for forests and the other for administration and planning. In this case too, gradual growth towards Model 2 is feasible. Otherwise there is no need to comment on details.

Models 4-I and 4-II: PFA of a federal government

In countries with federated states there is normally a national forest service responsible for the general forest policy throughout the country, for management of federally owned forests and for coordination of federal functions, such as education and research, in states or provinces. In addition there are state forest services^{1/}, each responsible for the management of state forests and for forest policy in each state in line with the overall federal forest policy.

1/ The adjective "state" applies here to federated units, which may also be called "provinces", as in Argentina.

F 6

MODEL 2: DEVELOPING PFA (headquarters structure)

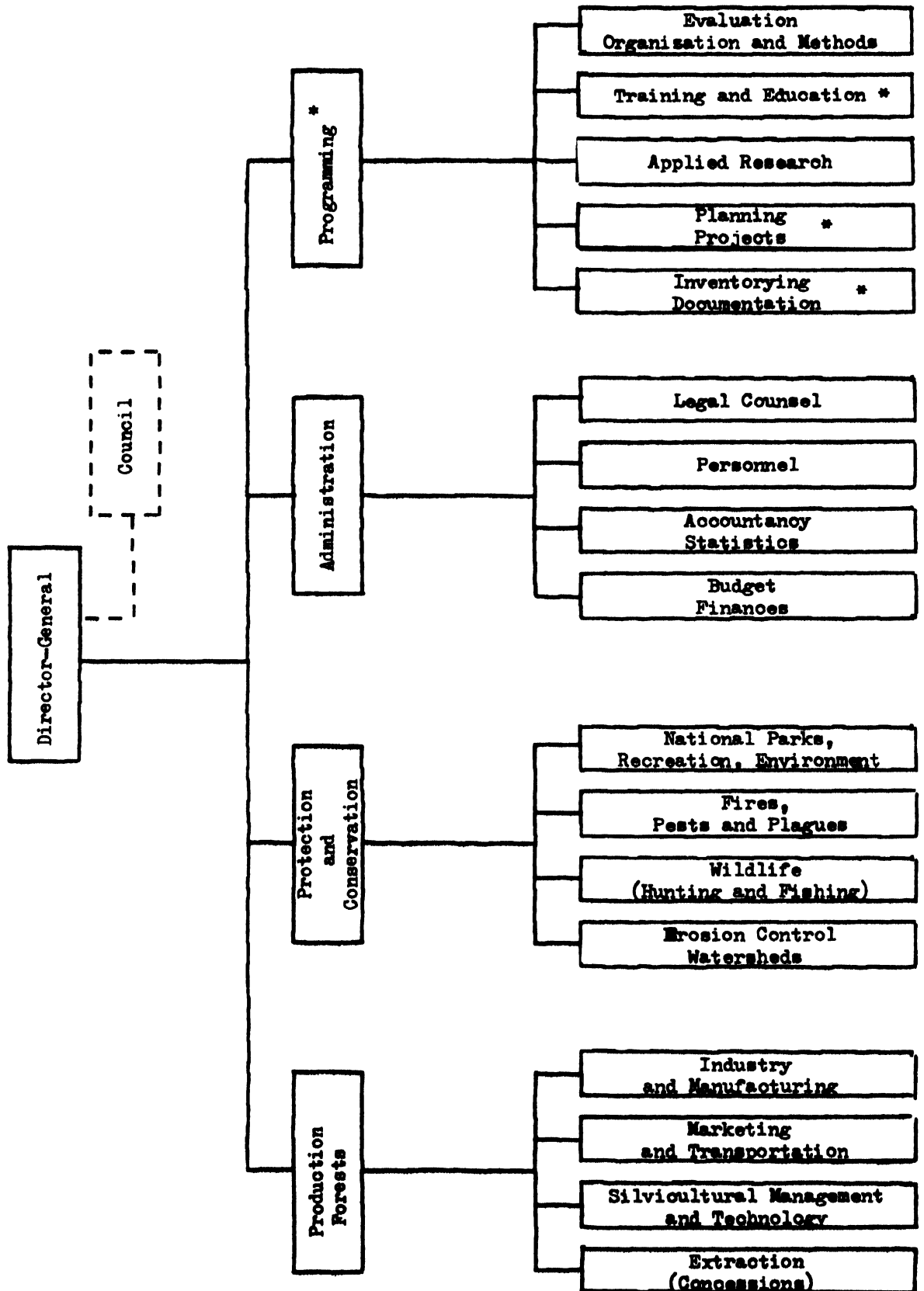


FIGURE 17

MODEL 3: YOUNG (INCIPIENT) PFA (headquarters structure)

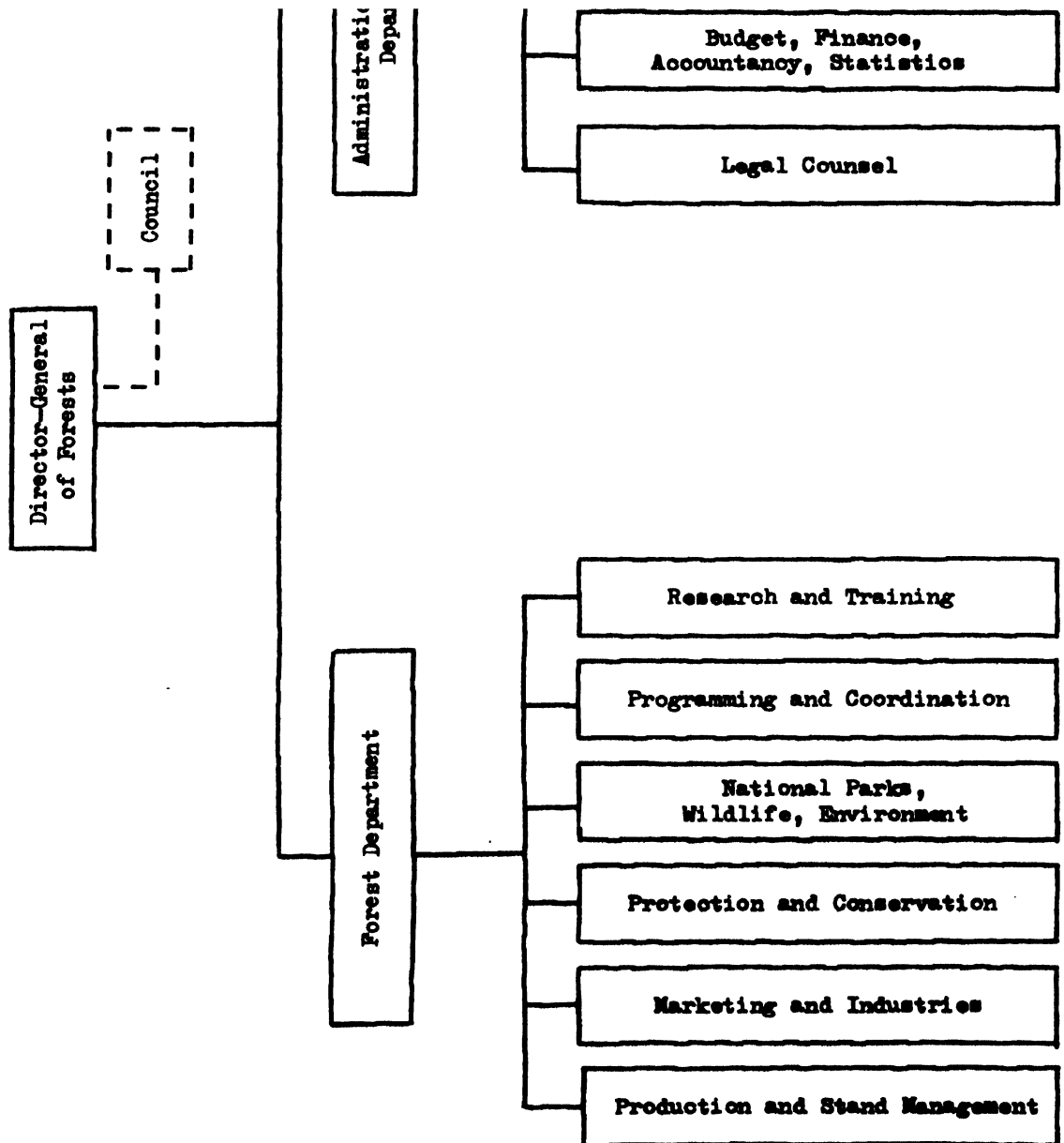


FIGURE 17A

MODEL 4-1: FEDERAL PFA (deconcentrated)

Federal (or National) Level

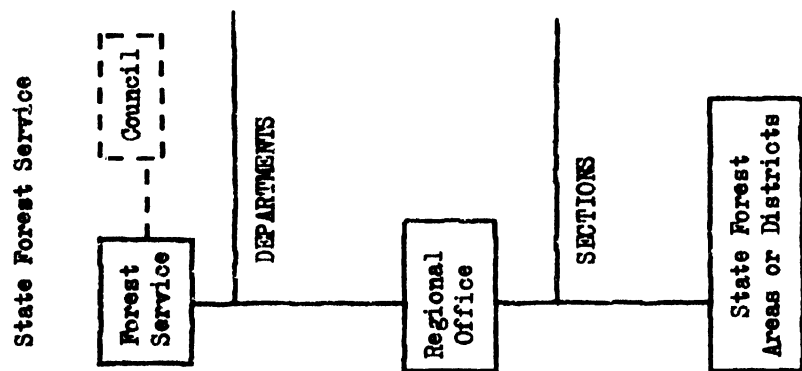
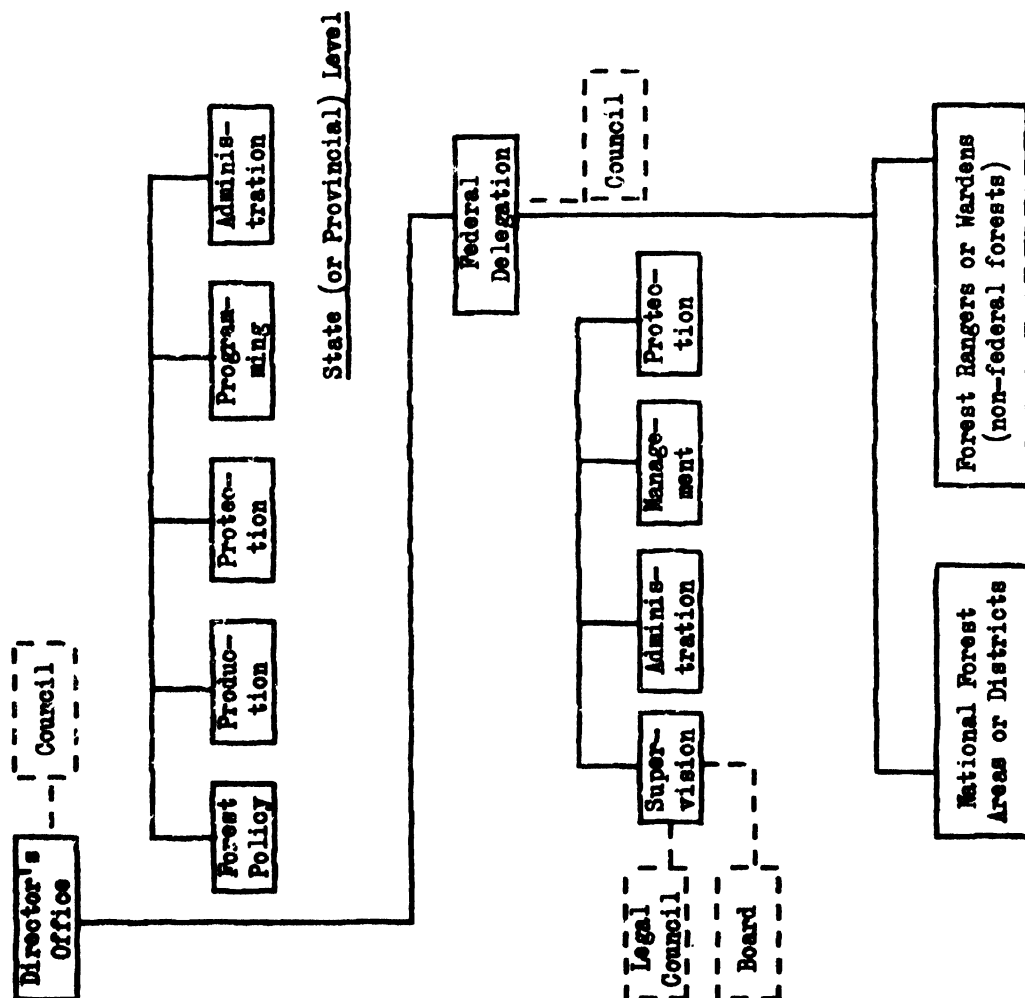
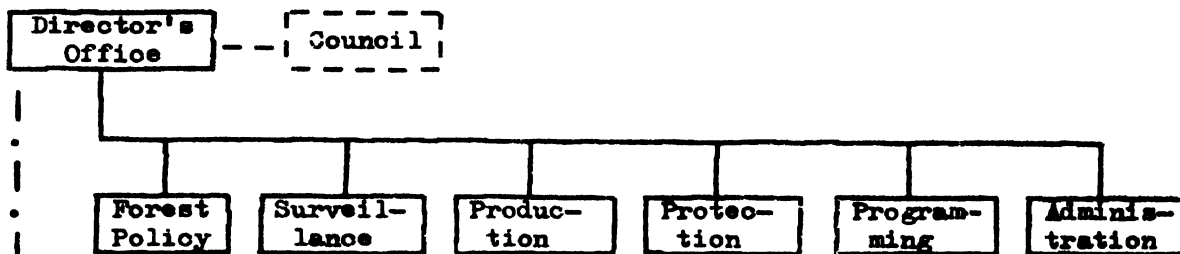


FIGURE 17B

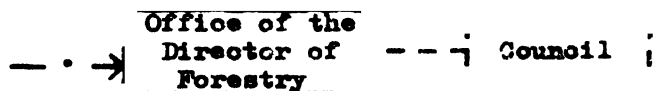
MODEL 4-II: FEDERAL PFA (decentralized)

National Level



State or Provincial Level

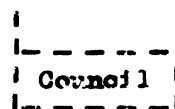
State Forest Service



DEPARTMENTS

Surveillance
of Non-State
Forests

Management
of National
Forests



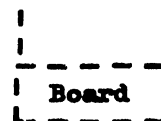
Regional
Head Offices

Technical

Administration

Surveillance

SECTION



Areas under
Surveillance

Forest
Districts

Forest
Rangers

The typical administrative problem in the relations between federal-level and state-level services is how to maintain control or ensure surveillance over enforcement of laws and implementation of forest policy in community or privately-owned forests. There are basically two ways of solving this problem, namely (1) the federal service enforces the law and implements federal forest policy among all owners (whether state, municipal or private) through its own branch offices throughout the country; or (2) the federal service delegates such functions to state services.

Model 4-I (FIGURE 17A) shows a type of organization corresponding to the first option. In this case the central office of the federal service has almost the same organs as shown in the previous models. Given the importance of the task of policy-making it would be advisable to create a forest policy department to draft forest laws, coordinate federal forest laws with the forest policy of the states and, possibly, to take charge of public relations, education, training and research. In each state there should be one branch of the federal forestry agency^{1/} in charge of implementation of federal forest policies throughout non-federal forest land in each state. To that end it would have a supervisory or surveillance section cooperating with a legal counsel and an advisory board. If the federation has its own public domain forests in a certain state, it will manage them directly. For that reason Model 4-I shows the departments of management and protection placed at the federal agency level. For effective control over field work it is necessary that there be created, as a third level, a forest rangers' or wardens' corps for regular surveillance of work being done by non-federal forest owners. In the case of federal forests, annual programmes and plans can be executed through district or area offices.

Model 4-II (FIGURE 17B) shows the second option, based on complete delegation of supervision, control and surveillance to the forest services of the states in order to ensure implementation of federal forest policy. The head of the federal service supervises the implementation of forest policy through state bodies. This solution implies official delegation of these responsibilities to state services which police all forests, irrespective of ownership, but always and solely through federal delegation of authority. The federal service should maintain control over the work thus delegated through on-the-spot inspection and reports submitted by the state services.

Again, none of the possible options can be stated to be the best in absolute terms. The actual solution will depend on circumstances, viz: the constitutional form of government; the provisions in the forest laws; the existence and/or phase of development of state services; the size and geographic distribution of the country's forests; and the availability of manpower or personnel.

The first option would be specially advisable if forest services of the states are lacking or if the federation possesses large forests. The second would be recommended, in principle, wherever well organized and developed state or provincial services exist or where there is a dearth of forest personnel.

^{1/} The liaison of this federal forestry delegation with other federal agencies in states or provinces will not be examined here.

CHAPTER IV

HUMAN RESOURCES

1. BACKGROUND

The availability - or dearth - of trained forestry personnel has been one of the main conditioning factors in the development of PFA's in Latin America. The history of their growth and affirmation in almost all countries reflects the achievements in university-level training of staff. The as yet incipient expansion of the field services of these administrations is explained in part by the relatively slow advances in training of intermediate-level technical and vocationally trained manpower in this field. About 15 years ago, the number of PFA's of the region that were sufficiently staffed to be considered true organizations could be counted on the fingers of one hand. Quite a few schools from which many of the foresters now working in the PFA's were graduated did not even exist in 1960. Only Argentina, Chile, Colombia, Mexico, Venezuela and the Inter-American Institute of Agricultural Sciences (Turrialba, Costa Rica) had by then been engaged for some time in the training of higher-level forestry staff. The dearth of university-educated foresters was partly overcome - as is still being done in certain other countries - by the recruitment of agronomists (*ingenieros agrónomos*) with some specialization in forestry. For the training of intermediate-level forestry technicians there were only six schools (in Chile, Cuba, Guatemala, Mexico, Uruguay and Venezuela), whereas there was virtually no systematic vocational training.

In the decade 1960-1970 there was a very vigorous expansion of university training in forestry with the establishment of four forestry schools in Brazil, Bolivia, Colombia and Peru. In addition, intermediate-level technical forestry schools were set up in Chile, Colombia, Cuba, Dominican Republic, Ecuador, Honduras and Trinidad. It was during that decade, once trained staff were available, that the rapid growth of PFA's became a general trend (see FIGURE 18).

Also during the period 1960-70 the Latin American Forestry Commission emphasized the need to strengthen PFA's above all by the training of manpower and fostering careers in forestry. The Seventh Session of that Commission (held in Mexico in 1960) noted the slow progress recorded in the organization of public administrations responsible for forest resources and recognized as the fundamental reason the lack of any real comprehension of the importance of the forestry profession. The Tenth Session (held in Port of Spain, Trinidad, in 1967) pointed out that the main obstacle to progress in this sector was the lack of strong services in charge of forest resources. It noted the definite correlation between the progress achieved in certain countries in the field of forestry and the strengthening of their forest services. The Eleventh Session (Quito, 1970), while recognizing the valuable work done by most forest services, stated that despite the great responsibilities placed upon forest services, their functions, rank and place within the government machinery were not always what they should be; their budgets did not enable them to accomplish their functions; the salaries with which the staff was working did not permit full-time dedication to the work, job tenure was uncertain, and there was a lack of balance in the deployment of technical staff.

The general panorama of forestry education in Latin America at the end of the decade 1960-1970 was described systematically by H.L. Shirley and J. Prats Llauredá^{1/}. Today much of the factual information published by these two writers is already outdated, which shows

1/ H.L. Shirley and J. Prats Llauredá - Forestry Education and Training in Latin America.
FAO, Rome, 1969 (FO/Risc/69/5).

the remarkable dynamism that has characterized most of the forestry education systems in this region. This by no means signifies that all shortcomings or difficulties have been overcome. As a matter of fact, as J. Bucarey pointed out ^{1/}, some of the basic limitations to availability of trained staff for forestry development still have to be overcome; there is a dearth of intermediate-level forestry technicians and vocationally trained workers; many university curricula have still not been properly adjusted to actual circumstances in the region; manpower resources and material means for educational use are still inadequate, and good institutional arrangements for fostering cooperation among training institutions still lacking^{2/}.

On the other hand, listing of achievements in Latin America in training and employment of forestry staff in recent years would be interminable. In general it can be said that higher education in forestry has improved in quality and there has been continuous quantitative expansion. With some exceptions, there is not yet any saturation of demand, even though the number of schools and programmes has already exceeded the forecasts for 1980 (see FIGURE 18). Some countries, Brasil being one, have in these few years multiplied the number of their professional foresters and have officially recognized forestry as a career, so that it is now easier for forestry professionals to find employment. Other countries, Argentina and Colombia among them, have furthered the process of deconcentration of professionals and technicians in the field of forestry by deploying them throughout the country. Other countries, Chile and Mexico for instance, have launched advanced systems of continuing education. Still others, Brasil and Venezuela in this case, offer considerably developed post-graduate forestry studies. Some small countries, including Honduras, have recently reached the "critical mass" of trained technicians and managerial staff, which enables them to undertake with confidence truly ambitious forestry development programmes. Cuba, pursuing its enlightened general policy of promoting education, has vigorously developed its system of forestry education and applied the "study/work" concept to all levels, including the university level which was introduced at the University of Havana in 1972. There are about a dozen countries which, because of their small geographical size, sparse population, and the relative insignificance of their forestry sector, or because of other physical and socio-economic factors, still have no real demand for trained forestry personnel that would justify a full-scale forestry education system. Among these countries some have, however, made notable efforts to provide some training, for example by sending students abroad, through on-the-job training, and through the establishment of silviculture departments in faculties of agriculture, and of schools for forest

There are still many gaps and considerable difficulties in the region with regard to training of forestry manpower as a whole. Still it must be said that there is universal agreement that well trained manpower is the principal motor of forestry development and that this concept must be constantly pursued. Among the purposes of the movement for strengthening institutions and administrative reform, in which many of the PFA's of the region are engaged, two have definitely to do with education, namely: providing more information to the public as to the importance and significance of forest resources and specific continuing training and education of serving personnel for forestry development work.

- 1/ J. Bucarey - "Forestry Education in South America". UNASILVA Vol.27, No.107.
- 2/ An important step towards fostering institutional cooperation was taken during the FAO/SIDA Forestry Education Development Seminar held in Quito, Ecuador, 10-28 May 1976, during which an "Association of Centres of Forestry Education in Latin America" was established.
- 3/ Useful suggestions on how to train forestry personnel at all levels in countries which cannot afford a complete system of forestry education are found in the paper: "Los recursos humanos en el desarrollo de administraciones forestales jóvenes" (Human resources in the development of young forestry administrations) by R. Delphin and J.I. Leyten, presented at the Seminar on Modernization of Public Forestry Administration in the Forestry Sector of Latin America, Lima, Peru, 10-29 November 1975.

FIGURE 18

LATIN AMERICA:
SCHOOLS OF HIGHER EDUCATION AND ACADEMIC FORESTRY EDUCATION PROGRAMMES
in 1968 and 1974, with 1969 projections
of 1980 requirements

Region or country	1968 ^{1/}	1974 ^{2/}	1980 ^{1/}
Argentina	2	4	2
Bolivia	0	1	0
Brazil	4	6	4
Caribbean	0	1	1
Central America	1	1	2
Chile	3	3	3
Colombia	3	3	1
Ecuador	0	0	1
Mexico	1	1	1
Paraguay	0	1	0
Peru	1	3	1
Surinam, Guyana, French Guinea	0	0	0
Uruguay	1	1	1
Venezuela	1	1	1
TOTALS	17	26	18

1/ H.L. Shirley and J. Prats Llauroadé - "Forestry Education and Training in Latin America". FAO, Rome, 1969.

2/ Forestry Department (FAO) - World List of Forestry Schools. FAO, Rome, 1974.

2. STAFFING

2.1 Situation and Trends

At the beginning of 1974 most PFA's of the region had permanent staff of between 50 and 3,700 persons (see FIGURE 19). For lack of complete information, data for the PFA's of three large countries - Argentina, Peru and Venezuela - were not included in this Figure, but the number of their university-trained staff may be estimated at 100 to 200 each, with a proportional number of staff in the other categories.

The staffing of the PFA's should not be confused with the manpower in the forestry sector as a whole. Comparing FIGURE 19 with FIGURE 20 it can be seen that in Colombia and Uruguay, for instance, a great number of the professionals and technicians actually hold jobs outside the PFA. However, in virtually all countries the PFA's are the principal employers of higher- and intermediate-level forestry staff. The diversification of jobs in this sector, marked in countries such as Argentina, Chile, Mexico and Venezuela, reflects a

FIGURE 19

EMPLOYMENT IN THE PUBLIC FORESTRY ADMINISTRATIONS IN 16 COUNTRIES OF LATIN AMERICA
(as of 1 January 1974)^{1/}

COUNTRIES	NUMBER OF PERSONS EMPLOYED							
	With university training		With intermediate-level technical training or equivalent		With vocational training		With no specific training	TOTAL
	(Engineers, etc.)		(Technicians, etc.)		(Forest guards, etc.)			
	Forestry	Other	Forestry	Other	Forestry	Other		
Belize	5	-	2	4	31	-	9	51
Bolivia	7	21	6	18	-	20	30	102
Brasil ^{2/}	127	64	-	58	156	506	453	1,364
Chile	84	45	281	107	26	64	242	849
Colombia ^{3/}	79	-	56	12	336	92	191	766
Costa Rica	5	16	-	6	-	36	51	114
Ecuador	64	8	96	4	18	6	8	204
El Salvador	1	36	2	24	11	120	182	376
Guatemala	4	7	36	19	23	20	508	617
Guyana	4	1	39	3	22	13	45	127
Honduras ^{4/}	20	5	112	27	42	15	99	320
Jamaica	5	5	62	30	40	-	65	207
Mexico	291	247	830	382	91	198	1,695	3,734
Nicaragua	-	6	-	-	-	-	2	30
Paraguay	15	1	5	8	3	14	2	48
Uruguay	15	5	9	6	-	-	177	212
TOTALS	726	467	1,536	708	799	1,104	3,781	9,121

Source: Replies to the National Questionnaire.

Footnotes: ^{1/} Or at the date closest to 1/1/74 for which information is available.

^{2/} Estimates for the IBDF only.

^{3/} INDERENA only.

^{4/} According to the FAO/IDB Report on the Olancho Forest Project, IDB, Washington D.C., 1974 (provisional text).

FIGURE 20

EMPLOYMENT IN THE FORESTRY SECTOR FOR UNIVERSITY-TRAINED
OR TECHNICALLY-TRAINED STAFF IN 10 COUNTRIES OF LATIN AMERICA
(as of 1 January 1974)

COUNTRIES	NUMBER OF PERSONS EMPLOYED			
	with university education (a)	with intermediate- level, technical training (b)	Ratio a:b (approximate)	Totals
Belize	6	6	1 a 1	12
Colombia	556	221	5 a 2	777
Costa Rica	33	10	3 a 1	43
Ecuador	116	106	1 a 1	222
El Salvador	43	27	4 a 3	70
Guyana	11	67	1 a 6	78
Jamaica	10	93	1 a 9	103
Nicaragua	10	7	1 a 1	17
Paraguay	23	14	5 a 3	37
Uruguay	41	20	2 a 1	61
TOTALS	849	571	3 a 2	1,420

Source: Replies to National Questionnaire.

degree of maturity of the forestry profession that seems to be correlated with the age of the schools. Another analogous index of maturity is the existence of professional foresters' associations, of which there were 11 in 1973 in nine countries in the region^{1/}:

1: Asociación Forestal Argentina
Centro Argentino de Ingenieros Forestales

Brasil: Sociedade Brasileira de Engenheiros Forestales

Chile: Asociación Chilena de Ingenieros Forestales

Colombia: Asociación Colombiana de Ingenieros Forestales
Sociedad de Ingenieros Forestales de Antioquia

L.I. Kelts - International Directory of Professional Forestry Associations and their Principal Publications. Journal of Forestry, Washington, D.C., August 1973, and International Union of Societies of Foresters "Directory of Professional Forestry Activities", USDA, Washington, D.C., 1973.

Ecuador: Sociedad Forestal Ecuatoriana

Honduras: Asociación Nacional de Profesionales Forestales de Honduras

Mexico: Asociación Mexicana de Profesionistas Forestales

Uruguay: Sociedad de Técnicos Forestales

The oldest professional foresters' association, and that now has the largest membership, is that of Mexico (founded in 1951). This is natural, because from the first graduating class of the Escuela Nacional Forestal at Santa Fe and Coyoacán, D.F. in 1911 up until the class of 1971 of the Forestry Education and Research Unit of the National School of Agriculture, Chapingo, a total of 706 professional foresters has been graduated. It can therefore be stated that the level attained by Mexico's PFA and the development of the country's forestry sector have been based on a continuous supply of university graduates in forestry for over 60 years.

Brazil's situation is quite different. Although it has had a federal forest service since 1926 and subsequently a well organized state forest service (in the State of São Paulo), its first higher school of forestry was opened only in 1960. The establishment of six higher schools of forestry within 15 years which can graduate foresters at an annual rate of over 200 is doubtless among the most spectacular and significant events recorded in Latin America as far as supplying forestry manpower is concerned. The rapid growth of the IBDF (established in 1967), that had 193 professional officers in 1974, shows the impact that availability of qualified staff can have on the development of a PFA.

A particularly noteworthy instance of the correlation between trained manpower and institutional development is provided by Honduras, whose government adopted an approach based on the development of manpower resources coupled with the strengthening of the operational capacity of its PFA. At the end of the 1960's, thanks to a professional staff training programme, many professional foresters were trained abroad. During that same decade (1969), the Escuela Nacional de Ciencias Forestales - ESNACIFOR (National School of Forestry Sciences) was established. Since 1959 already the Government has had a Forest Guards' Corps. By about 1973, Honduras could rely on a considerable pool of nationals trained in forestry, capable of vigorously promoting the country's forest development. In 1974 the Government established CODEFOR, whose forest management office is now staffed as follows:

Professionals	25 (of whom, 20 foresters)
Technicians	139 (of whom, 112 foresters)
Technical field assistants	136
Office aides	20
Total:	320

In the case of Chile's PFA, the recent increase in staff has been as follows:

1971	55 employees
1972	460 "
June 1973	710 "
December 1973	849 "

An important point regarding the staffing of the PFA is the kind of training received by staff of every level. FIGURE 19 indicates the percentage of university-educated staff that had received training in forestry in certain countries, namely Colombia, Ecuador and Honduras, there is a large number, while in other countries, viz: Brazil, Chile and Mexico,

the number is still high, while in yet others, Bolivia and Guatemala, the number is smaller. The overall average of 61% indicates the impact of graduates of Latin American forestry schools on these numbers. By way of comparison with a PFA, the history of which has always depended on the number of professional foresters (*ingenieros de montes*), it should be noted that in 1974 Spain's ICONA had 496 professional foresters out of a total of 564 university-educated staff, equivalent to 89.7% of the total. Since the PFA's deal mainly with technical matters, most of the staff in the line of command are either persons holding degrees in forestry (*ingenieros forestales*) or else persons holding degrees in agriculture (*ingenieros agrónomos*) with specialization in forestry. Only among higher-echelon staff at the central office level, and sometimes at the regional level, are there also other kinds of professionals (lawyers, civil engineers, graduates of commercial schools, economists, and so forth) in specialist posts.

2.2 Staff Deployment

This study confirms the current opinion that unbalanced deployment of staff, and not merely shortage of staff, is a very common shortcoming of PFA's in Latin America. Three aspects of this staffing will now be discussed:

- a) spatial deployment: i.e. location of staff
- b) functional deployment: i.e. work assigned to staff
- c) structural deployment: i.e. numerical ratio between staff at different levels.

Spatial and functional deployment are closely correlated. Whereas it is normal for practically all the managerial and planning staff to be located in the capital, most of the staff engaged in forestry operations are assigned to the field offices. Still it may happen that the field offices do not actually have operational functions, but do mainly bureaucratic work. Inversely it may happen, especially in small countries, that almost all genuine operational staff is based at headquarters.

2.2.1 Spatial deployment

The need to achieve a sufficient degree of spatial deconcentration is a feature of all PFA's throughout the world. This is due to the functions of supervision and normally also of management which PFA's must exercise over vast tracts of land, frequently in inaccessible areas far away from the capital. Information on the spatial deployment of staff given here refers principally to countries with a federal structure and illustrates mostly the distribution of staff between the national capital and provincial towns, while it provides little information on deconcentration down to the field personnel level. Such information, however incomplete, shows that the levels of spatial deconcentration and decentralization are still not satisfactory, although there is a tendency to improvement as manpower resources increase and more funds are made available to PFA's.

Argentina's IFONA is not very deconcentrated considering that 47 of its professionals work in the central office and only 18 out in the field. Still, IFONA, together with the provincial forest services, constitutes a fairly decentralized system, since the 18 provincial forest services have a total of over 100 professionals and a total staff of over 2,500. There is considerable deconcentration of the Dirección General de Bosques of INDERENA in Colombia, since this agency has 18 foresters in its central offices and 51 out in the field. On the other hand, many of Colombia's forest officers work in the decentralized system made up of the Secretariats of Agriculture of the Departments, and above all of the 12 'corporaciones forestales' that function as autonomous, semi-governmental agencies. Venezuela, with its Guyana and Andes authorities, offers an analogous case.

In Brasil, the growing availability of high-level forestry staff has speeded up the process of field deconcentration that the IBDF has been fostering in recent years in the Amazon. Deconcentration is achieved through state delegations of the IBDF that cooperate with the forestry commissions of the various states (Amazonas, Pará and, recently, also Acre). In the case of Mexico, an idea of the spatial distribution of forestry staff (in general and not solely that of the PFA) can be obtained from the national census of Mexican

professionals of 1972, viz:

Professionals in the Federal District	176
Professionals in 10 states (from a maximum of 35 in Michoacán to a minimum of 10 in Veracruz)	178
Professionals in 22 states (from a maximum of 8 in Chiapas to a minimum of 1 in Aguascalientes, Hidalgo, Queretaro, Tabasco, Zacatecas)	68
Total:	422

In Central America, Honduras stands out for having greatly deconcentrated its PFA staff, mainly since the establishment of CONDEFOR (in 1974).

2.2.2 Deployment by functions

FIGURE 21 gives an idea of the functions of the higher-echelon staff in 15 PFA's in Latin America, broken down under the following headings: a) managerial or executive; b) planning and programming; c) research; d) staff training; e) field operations. Note the high percentage of staff in the first three groups versus the low proportion of staff doing field work and training.

FIGURE 21

MAIN FUNCTIONS OF UNIVERSITY-EDUCATED STAFF IN 15* PUBLIC FORESTRY ADMINISTRATIONS IN LATIN AMERICA

FUNCTIONS	University-educated staff ('ingenieros', etc.)			
	Forestry	Other	Total	%
	(a)	(b)	(a+b)	
Managerial and executive	161	106	267	22.8
Planning and programming	72	100	172	14.7
Research	97	89	186	15.9
Staff training	22	20	42	3.6
Field operations	197	92	289	24.7
Other	157	55	212	18.3
TOTALS	706	462	1,168	100

Source: Replies to the National Questionnaire.

* Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Jamaica, Mexico, Nicaragua, Paraguay and Uruguay.

FIGURE 22

**SUBSECTORAL DISTRIBUTION OF UNIVERSITY-EDUCATED OR TECHNICALLY TRAINED STAFF
EMPLOYED IN THE FORESTRY SECTOR IN 10 COUNTRIES* OF LATIN AMERICA**

Subsector	Number of employees			
	With university education		With intermediate-level technical training or equivalent	
	Forestry	Other	Forestry	Other
Public forestry administration	188	72	271	97
Forestry education and research	84	4	6	2
Private forest enterprises (including industry and commerce)	208	46	73	32
Other (including other sectors)	243	4	90	-
TOTALS	723	126	440	131

Source: Replies to the National Questionnaire.

* Belize, Colombia, Costa Rica, Ecuador, El Salvador, Guyana, Jamaica, Nicaragua, Paraguay, Uruguay.

FIGURE 23

**SUBSECTORAL DISTRIBUTION OF UNIVERSITY-EDUCATED OR TECHNICALLY TRAINED STAFF
IN 4 EUROPEAN COUNTRIES**

Subsector	Austria		Denmark		Finland		Norway		TOTAL	
	P	T	P	T	P	T	P	T	P	T
Public forestry administration	427	1,053	87	250	358	240	170	590	1,042	2,133
Forestry education and research	115	56	47	10	240	80	110	110	512	256
Private forest enterprises (including industry and commerce)	221	942	89	300	854	3,060	320	900	1,484	5,202
Other (including outside employment)	216	48	72	100	380	310	170	150	838	608
TOTALS	979	2,099	295	660	1,832	3,690	770	1,750	3,876	8,100

Source: Replies to a questionnaire for the European Forestry Commission (1975).

If one considers broader functional groups for the entire forestry sector (see FIGURE 22) one gets an idea of the relative employment opportunities offered by: a) the PFA's; b) educational and research institutions outside the PFA's; and c) private enterprise. It is interesting to compare FIGURE 22 with FIGURE 23 which give the same kind of information with reference to four countries of central and northern Europe. In the 10 countries of Latin America, as in the four countries of Europe, the distribution of university-educated staff in the four functional groups is virtually the same: 25-30% in the PFA; 10-15% in education and research; 30-40% in private enterprise and the rest in other activities (i.e. mainly outside the forestry sector or outside the country). The situation is quite different as regards technical staff, since in Latin America over 50% of the technicians are working in the PFA's, while in European countries over 65% are working in private enterprises.

2.2.3 Structural deployment

Since most activities of the PFA's are either operational or supervisory, but always field operations, their ideal structural model is a pyramidal one. At the apex of such a model there is the director, and below there are the professionals, technicians, foremen, skilled workers, and unskilled workers. It is very difficult to conform to this ideal model if the availability of technicians and of skilled labour is inadequate. Certain PFA's of Latin America have disproportionately more university-educated foresters than technicians and skilled workers (in some instances the ratio is 3 foresters to 1 technician).

Ecuador's PFA staff has increased steadily in the past eight years as follows:

<u>Categories</u>	<u>1966</u>	<u>1970</u>	<u>1974</u>
Professionals	39	59	72
Technicians	64	89	100

While the gradual increase of trained staff in general is a positive factor, the imbalance between professionals and technicians is evident and has even slightly increased with the passing of time, from 1/2 to 7/10.

The numerical ratio of professional staff to technical in Costa Rica's Forestry Department has evolved as follows:

<u>Categories</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
University-educated staff	13	14	17	21
Staff with intermediate-level technical training	7	6	6	6

The ratio of professional to technical staff rose from 2/3 to 7/2, that is to say, what has been formed is really an inverted pyramid. The general situation for the 16 countries of Latin America can be seen in FIGURE 19. Only Chile, Guatemala, Guyana, Honduras, Jamaica and Mexico have a numerical ratio of professionals to technicians compatible with the pyramidal structure. This means that frequently the professional forester has to perform many tasks that could be assigned to properly trained subordinates if they were not too few in number. Although the number of technicians and skilled labourers is growing, only rarely is there a ratio of even 1/1 between professionals and technicians. Under these circumstances the professional cannot exercise his supervision or control functions with uniformity, and this may cause problems in human relationships. Furthermore, such distortions complicate the delegation of responsibility, the sine qua non for decentralization. The data in FIGURE 19 show the following deployment of staff in 16 PFA's according to level of training:

Staff with university education

Forestry	726	Ratio of <u>university-educated staff</u> to <u>technically-trained staff</u> = 1 to 2 approx.
Other	467	
TOTAL	1,193	

Staff with intermediate level technical training

Forestry	1,536	Ratio of <u>technical staff</u> to <u>vocationally-trained staff</u> = 1 to 1 approx.
Other	708	
TOTAL	2,244	

Staff with vocational training only

Forestry	799	Ratio of <u>vocationally-trained staff</u> to <u>unskilled workers</u> = 1 to 2 approx.
Other	1,104	
TOTAL	1,903	

Unskilled workers

TOTAL	3,731
GRAND TOTAL	9,121

A comparison of these numerical ratios with those in FIGURE 24 referring to five European countries gives a good idea of the considerable difference in structure:

15 countries of Latin America:

P 1193
T 2244
V 1903

5 countries of Europe:

P 2682
T 5239
V 16222

If we now consider the forestry sector as a whole, the numerical ratio of university-educated to technically trained staff seems even less favourable. This is true in the ten countries of Latin America listed in FIGURE 20, excluding Guyana and Jamaica. This figure can be compared with FIGURE 25 which gives data for Europe and East Africa.

These comparisons confirm the diagnosis of many writers who have pointed out that the scarcity of technically and vocationally trained staff is one of the most serious shortcomings not only of PFA's but of the entire forestry sector of Latin America.

FIGURE 24

EMPLOYMENT IN PUBLIC FORESTRY ADMINISTRATIONS OF FIVE
EUROPEAN COUNTRIES ACCORDING TO LEVEL OF TRAINING

(data referred to 1973)^{1/}

COUNTRIES	Number of employees		
	With university education (foresters, etc.)	With intermediate- level technical training (skilled labourers, etc.)	With vocational training only (forest rangers, etc.)
Austria	427	1,053	785
Finland	358	240	4,950
Hungary	1,163	2,598	3,000
Norway	170	590	2,000
Spain	564	758	5,487
TOTALS	2,682 (a)	5,239 (b)	16,222 (c)
Ratio $\frac{a}{b}$ = 1 to 2 approx.			
Ratio $\frac{b}{c}$ = 1 to 3 approx.			

FIGURE 25

EMPLOYMENT IN THE FORESTRY SECTOR OF UNIVERSITY-EDUCATED OR
TECHNICALLY TRAINED STAFF IN 11 COUNTRIES OF EUROPE & AFRICA

(data from 1970 to 1974)

COUNTRIES	Number of employees		
	With university education (a)	With technical training (b)	Ratio $\frac{a}{b}$ (approx.)
EUROPE ^{1/}			
Austria	979	2,099	1 to 2
Denmark	295	660	1 to 2
Finland	1,832	3,690	1 to 2
Hungary	1,700	2,880	3 to 5
Norway	770	1,750	2 to 5
TOTALS	5,576	11,079	1 to 2

^{1/} Replies to a questionnaire for the European Forestry Commission (1975)

(Fig. 25, continued)

COUNTRIES	Number of employees		
	With university education (a)	With technical training (b)	Ratio $\frac{a}{b}$ (approx.)
AFRICA^{2/}			
Cameroon	37	126	3 to 10
Congo	50	260	1 to 5
Gabon	18	30	3 to 5
Ghana	25	300	1 to 12
Ivory Coast	50	260	1 to 5
Liberia	25	20	1 to 1
TOTALS	166	755	2 to 9

2/ F. Schmitthjensen - Contribution to a World Bank study on the Forestry Sector in West Africa (unpublished).

2.3 Personnel Administration

2.3.1 General policy

As is normal in all civil services, the selection, recruitment, promotion and remuneration of PFA staff are adjusted to prevailing general practice. But adherence to these common norms does not mean that the PFA's should not legitimately enjoy some degree of freedom. As a rule the PFA of a centralized type allows little margin for variation, especially as regards salaries, which are determined according to point systems, scales, or schedules established centrally by the civil service.

Autonomous or semi-autonomous PFA's seem to have wider latitude in application of general policies in force for civil servants. Honduras' CONDEFOR, for instance, enjoys wide powers of recruitment of professional staff, including foreigners. INDERENA of Colombia has its own Industrial Relations Division for the recruitment, selection, contracting and classifying of its staff. In both cases, of course, it cannot be said that the PFA's have their own personnel policy, but rather that the special features of their institutional terms of reference are recognized, and consequently they are allowed a certain flexibility in recruitment and retention of whatever staff is required under their mandate. Normally the variants in this matter are attributable either to the fact that no general personnel policy has been defined for the civil service, as in the case of Nicaragua, or else that the PFA has as yet not been brought under the general provisions governing administrative careers, as is the case in Bolivia. As has been seen recently with regard to Brazil, the incorporation of foresters in the cadres of the public administration has been one key to making the PFA's more highly technical, and consequently to promoting forestry development.

Mexico, an exception in Latin America, has a basic forest law (the Forest Law of 9 January 1960) describing the foresters' profession, their professional functions at the head of the field services of the forest administration (the forest regions or districts), and also describing the professional forestry corps. This is in fact the sole case in Latin America of which it can definitely be said that there is a specific personnel policy for the PFA. Mexico's case is comparable to that of France and Spain, whose professional forestry corps were set up over a century ago as the backbone of their respective forest services, so that the principal explicit function of the higher schools of forestry has been to train upper-echelon civil service staff for the PFA.

2.3.2 Recruitment

Only rarely is recruitment of new staff a responsibility in which PFA's enjoy complete autonomy, at least as far as the upper- and middle-level posts are concerned. As a rule, PFA's share this responsibility with some outside organisational unit, usually the personnel service of some ministry. The recruitment process leads to a decision, i.e. the making of official appointments which, depending on the case, occurs at various levels and in different offices in compliance with the laws in force in each country. The carrying out of the decision then devolves on the personnel office. The decision to appoint is sometimes taken for reasons or under circumstances beyond the control of the PFA but the important thing is that the latter be fully involved in normal procedures that lead to objectivity in the taking of the decision, namely in making the job descriptions and in evaluating the candidates.

The job description for each of the posts in the administration is a firm and clear basis for the staff recruitment process. Many countries have a more or less broad description of posts for their PFA's. A few illustrations are given in FIGURE 26. As a rule there are formal descriptions only for the highest posts. In some cases these descriptions hold closely to the general manual for job classification for the civil service. The form of the description may vary. It seems advisable to divide this description into basic functions and activities, indicating also the extent of responsibility.

FIGURE 26

THREE ILLUSTRATIONS OF JOB DESCRIPTIONS FOR PFA'S IN LATIN AMERICA

CHILE

DEPARTAMENTO TECNICO ZONAL (Zonal Technical Department)

Organisation: Zonal

Department: Technical

Post: Department Chief

Principal duties: To direct and coordinate at the highest level the work of programming and planning, and control and technical assistance to be rendered by the Zonal Office to management districts or units for efficient implementation of plans and prog

is: To coordinate, and collaborate in, the framing of new plans and for the zone.

To prescribe how technical assistance and training is to be furnished to management districts and units.

To supervise, coordinate and control work in all sections under the responsibility of the officer.

To coordinate and monitor programming and check on performance of work in fields related to the training and security of the authority's workers.

To coordinate and control programming and check on performance of work in matters relating to the care of machinery and vehicles, construction of civil engineering works, etc.

To coordinate and control the elaboration of programmes and supervise the performance of duties of specialists in the Forestry Section.

To coordinate collaboration among zonal specialists of the Regional Planning Office for the framing of management plans.

To compile information for each Zonal Director in accordance with instructions issued, and to advise the latter in matters having to do with work planning and management of forests.

Qualifications required of Department Chief

Education: A degree in forestry (title of 'Ingeniero Forestal')

Experience: 3 to 4 years of professional work.

Other requirements: Preferably knowledge of, and some experience in, planning and administration work.

Staff Relations

Line subordination: The Department Chief comes under the Zonal Director.

Supervision: The Technical Department is comprised of the following units:

- Programming and Control Section
- Forestry Section
- Infrastructure and Drafting Section
- Training and Security Section.

COLOMBIA

MIDDLE-LEVEL TECHNICIAN

Qualifications: Schooling to the level of "perito" or the equivalent in experience.

Functions: Overseeing semi-skilled or unskilled labour. Taking detailed decisions in the course of operations.

Responsibilities: Execution of orders of his superior (Técnico Superior) and reporting on use of manpower and staff assigned to technical work.

PARK WARDEN OR FOREST RANGER

Qualifications:

- Peruvian by birth
- Discharge from the Armed Forces
- Secondary schooling
- Completion of a course as park warden or forest ranger
- Good conduct certification and aptitude for the job.

Specific functions:

- To advise the Director or the Chief of the park or forest reserve on control work and performance of tasks
- To organize patrols of various zones
- To take part in the patrolling
- To make animal

The qualifications for each post are written up in the job description. Requirements must be clearly specified as regards education, experience (in various fields), professional or vocational aptitude, managerial ability, personal qualifications.

It is very significant that INDUMENA (Colombia) is giving preference in promotion to candidates with considerable field experience. In principle this is very sound because decisions taken at higher levels will usually be better and fit in more with the actual

situation when the person appointed has had such experience. It would be interesting to examine the advisability of having every forestry officer begin his career with at least a minimum mandatory period of field service.

2.3.3

Employees of the PFA's are paid according to regular civil service wage scales. Even though autonomous PFA's do have some budgetary flexibility within the limits of their own statutes, it does not appear from information to hand that this flexibility is normally reflected in higher salaries for their staffs, although they may enjoy more operational leeway and have at their disposal a greater amount of equipment, vehicles and a better infrastructure, all of which constitutes a real incentive.

The principle that civil servants should - aside from such perquisites as family allowances, in-grade steps for years of service, and so forth - have salaries on a par with posts that are considered comparable holds true generally, though with some exceptions. In Ecuador, for instance, it seems that the officers of the Ministry of Public Works receive lower salaries than those of other ministries in view of the competition due to the private sector's recruitment of civil engineers. This same phenomenon is beginning to be felt on the employment market for foresters, especially in countries where forests are privately owned or that have a well developed forest industry sector, or whose laws on fiscal incentives open wide opportunities for consultant firms. In such cases an exodus from the civil service occurs and it is difficult for the PFA to retain highly competent professional foresters.

Some countries have furnished specific data on the remuneration of their forestry staffs. In the Forest Service of El Salvador the average initial salary for a professional forester is equivalent to roughly between US\$ 250 and 300 per month and the salary rises to US\$ 450-500 per month after 4 to 5 years of service. In Costa Rica's Forest Department, the average monthly salary runs from 3,400 to 3,600 colones (equivalent to US\$ 390/420).

2.3.4 Evaluation

There is always at least one way to evaluate staff, viz: by the direct supervisor, often by intuition. Up to a certain point the evaluation affects the professional career of the subordinate. Individual evaluation by the supervisor, on the basis of his personal views and his interpretation of achievement, aptitude and so forth, involves a certain risk for a subordinate, since there can be misinterpretation and either over- or underestimation of one or another aptitude. For this reason it is advisable to have some objective method of evaluation, using well defined criteria and verifiable results. Yet there is always some resistance to any system of evaluation based on a selected set of criteria and applied by more than one evaluator.

The PFA's of Ecuador and Peru have systematic procedures for staff evaluation. In the case of Peru the system is based on its personnel qualification rules (1971) which prescribe evaluations at two levels: the qualifying level (three persons) and that of approval. There are nine qualification headings, of which two are of special interest: personal qualifications (education, ability to express oneself, self-confidence, personality, serenity and tact, comprehension, modesty, commitment, courtesy, solidarity, loyalty) and performance (professional ability, documentation, enthusiasm, initiative, punctuality and attendance, responsibility, devotion to duty, discipline, intelligence, method and organization, physical aptitude, perseverance, personal appearance and self-sufficiency). The final grading or evaluation obtained as a weighted average of these nine points may be one of the following: suitable for promotion, not suitable for promotion, or unqualified. Any person rated unsatisfactory has to be re-evaluated three months later. The evaluations obtained are located individually to the interested party only.

3. TRAINING OF SERVING PERSONNEL

A very significant trend in the evolution of the PFA's in Latin America in the past few years has been the growing attention that virtually all of them are paying to the training of their own staff. This trend is particularly marked in those PFA's that have large staffs, but is also apparent in those with smaller staffs, as in Belize, El Salvador and Jamaica.

Training of staff in service within the context of continuing education is carried out in various ways. Some PFA's have developed their own systems and internal training facilities, while others rely on existing institutions outside their own organization. Still others combine both methods, as in the case of INDERENA (Colombia) which has both its own training school for inspectors of forest resources in Pereira as well as an arrangement with Colombia's National University for the training of forestry technicians at the Piedras Blancas School in Medellín.

Training inside the PFA itself is advocated for forestry work involving much biological and technical content, especially if this work is of a permanent type and of sufficient volume to justify the institutionalisation of training and the furnishing of equipment, premises, etc. If these conditions do not exist, it is advisable to have recourse to institutions not under the PFA, namely universities, training centres for other branches of the public administration, and private schools. Such cooperation with institutions outside PFA's is particularly suitable for training in specialities or in subject fields that normally do not constitute part of the core of the forester's education (for instance, administrative techniques, business management, socio-economic development, etc.). Among such institutions are the universities (various faculties), public administration schools and specialized schools (for instance, for business management courses). Recourse is had to these educational facilities principally for highest-echelon staff of the PFA's (local chiefs, regional chiefs, heads of specialized departments and top headquarters staff). If one relies on universities, it must be remembered that the courses they offer are usually highly theoretical, whereas the training required is normally for practical purposes.

The National Forest Authority of Chile is a noteworthy example of an inside staff training system. The Subsecretariat of Forests and Wildlife of Maricao is instituting a very interesting programme of continuing education. It may be mentioned that in both instances, although the PFA's will initially train their own staff or manpower closely connected with their work, they intend to gradually enlarge the scope of their training to all workers in the forestry

The programme of forestry training which Chile's National Forest Authority is developing with assistance from a UNDP/FAO project is based on recognition of the fact that in the forestry sector, manpower and technology are crucial factors that determine the degree of dynamism and the economic soundness of operations in this sector. The general goal of this programme is to raise the technical know-how, performance, efficiency and safety of workers in the forestry sector. The programme is centred on the training of middle-level staff and skilled labourers. The training of the former in various forestry techniques by methods of on-the-job training, supervision and instruction converts them into true teachers or instructors of their own workers or persons for whose supervision they are responsible. In 1974 this programme offered mobile on-the-job training courses for middle-level manpower and skilled workers; technical seminars for technical and professional staff; preparation of pedagogic material and instruction manuals; teacher training (in pedagogy and teaching methods); and regular courses. FIGURE 28 shows the structure of this training programme/

J. Bucarey recently reviewed the work of training in forestry conducted in Chile and pointed out the need for coordination^{1/}. This author gives the following summary (FIGURE 27):

FIGURE 27

SUMMARY OF COURSES AND STAFF TRAINED IN CHILE, AS
RECORDED BY THE SCHOOLS WHICH SUPPLIED INFORMATION

Courses	Institutions	Number of persons trained
4	Centro Forestal Llanocaura	30
1	Corporación de Fomento de la Producción (The Production Promotion Authority)	8
1	Ministerio de Agricultura	20
	CORA - SAG	300*
	DTICA - INFOR	500*
	DIAP	900*
	Others	8,000*
	Carabineros de Chile (Police Force of Chile), Patrulla Forestal (The Forest Patrol)	1,500*
57	Corporación Nacional Forestal	863
2	Universidad Técnica del Estado	20
4	Universidad Católica de Chile	160
1	Universidad Austral de Chile	60
131	Instituto Forestal	1,486
	Empresa (private enterprise)	600
201	OVERALL TOTAL	14,447

* Estimated figures.

J. Bucarey points out that there is lack of coordination in forestry training and recommends that work being done in isolation by state bodies, universities, private enterprise and religious bodies be institutionalized and coordinated. He urges coordination for the better utilization of existing forest resources through the organization of a programme for forestry training for all of Chile^{2/}.

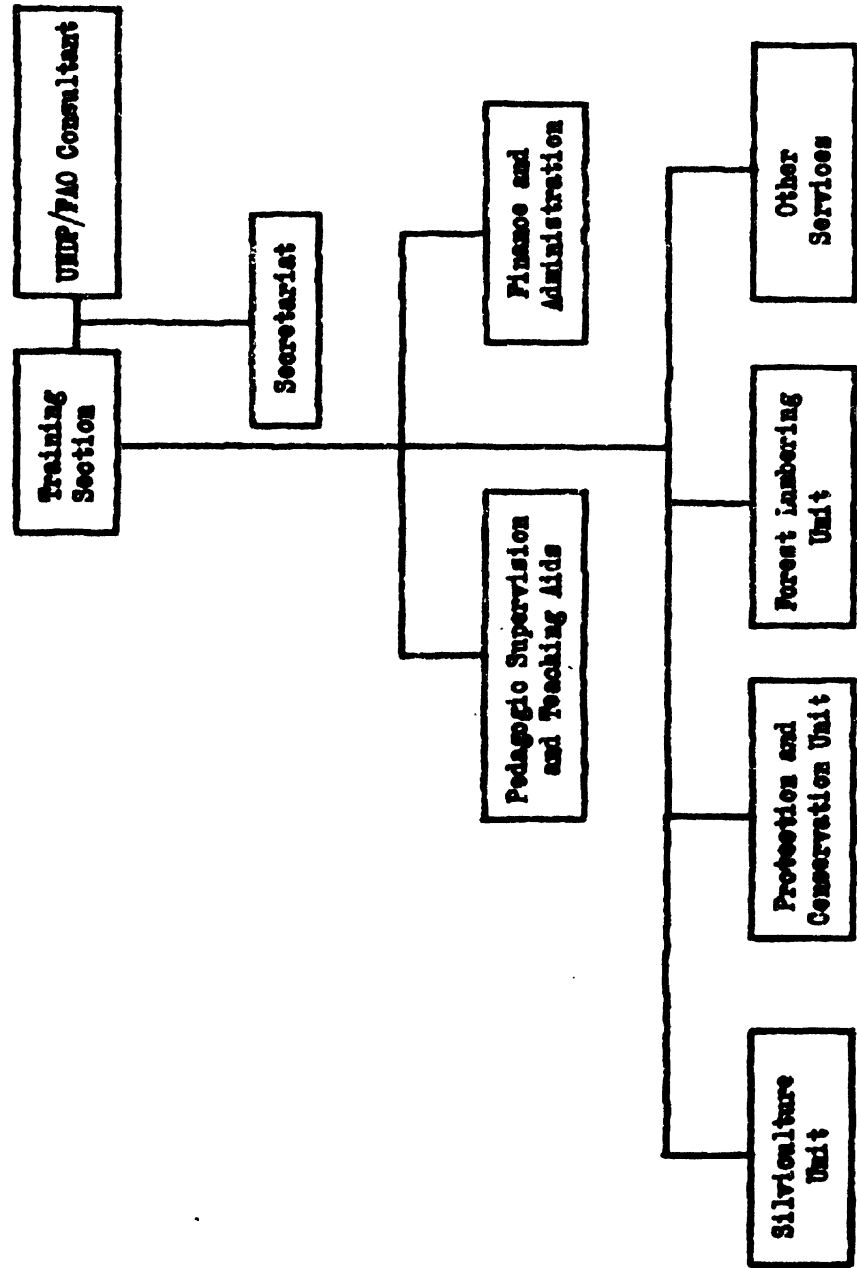
In Mexico, the continuing education programme of the Under-Secretariat for Forests and Wildlife has the following long-term goals: to update 500 professional foresters and 800 subprofessionals in service; to cover the training needs of 30,000 forest workers; to educate and train forest owners and managers; to offer guidelines to government officials, directors and journalists; to advertise technological advances and collaborate in research

- Informe sobre la capacitación forestal en Chile. Termas de Catillo, Chile, 1975.

2/ J. Bucarey - "Programa de Perfeccionamiento del Personal Forestal de Chile". Termas de Catillo, Chile, 1975.

FIGURE 28

CHILE: ORGANIZATIONAL CHART FOR TRAINING PROGRAMME OF THE CORPORACION NACIONAL FORESTAL (CNF)



programmes. By means of intensive theoretical and practical courses an attempt is being made to improve short-term training of staff at all levels as regards timber and fuelwood production and training of instructors in basic logging and extraction operations. At the same time the Undersecretariat for Forests and Wildlife will continue to encourage small forest owners and forest workers to take training courses.

Cuba's INDAF is organizing a wide range of continuing education and extension courses. The purposes of such training can be summed up as follows: to raise the cultural and educational level and improve skills of workers through training, to increase work output, awaken a forest consciousness, expedite economic and social development and promote sharing of experience^{1/}.

One country whose forest service avails itself of outside educational institutions for training purposes is Bolivia whose manpower training centre of the Ministry of Labour and Social Security has been giving courses in saw maintenance and saw doctoring. One very frequent training practice is the granting of fellowships or scholarships abroad, but it is the universities, and especially the schools of forestry of each country that can play an important role in the training of forestry manpower in special or advanced subjects. The ideal would be close cooperation between the universities and the forest services in the preparation and offering of training courses, as is exemplified by the forest service of the State of São Paulo (Brasil). There are also applied forestry research institutions that can offer training in specialized fields, as is happening in Mexico.

In Peru there are interesting cases of cooperation with special training institutions. For instance, the Centro Nacional de Capacitación e Investigación para la Reforma Agraria (CENCIRA) (National Training and Research Centre for Land Reform) of the Ministry of Agriculture is doing training work in forestry. Training offered by CENCIRA reaches public officials in the field of agriculture and other parts of the civil service, whatever their rank, as well as farmers and farm managers. Another instance worth mentioning is the training of officials at the Instituto Nacional de Administración Pública (INAP) which, among its other functions, has the task of "training and motivating civil servants". The Escuela Superior de Administración Pública (ESAP) under INAP is in charge of training work and offers appropriate programmes for civil servants at different echelons, including those of the Forest Service. The methods applied have been worked out carefully and permit the evaluation of the results of such teaching.

In Paraguay the National Forest Service is organizing with Swiss technical cooperation 17-month courses for forestry technicians. There are good prospects that this country will reach a pact for such assistance with the Government of Venezuela in order to train Paraguayan forestry staff.

Given the trends observed in the PFA's in the region, the need for training of all staff needs hardly any justification. Any PFA that ignores the importance of, or need for, training will be unable to attain its goals, to function efficiently or improve its achievements. The administrations themselves must be the first ones interested in their own efficient functioning from the standpoints of technology, economics, and social and human relations thanks to the application of all available knowledge. This explains the need for compulsory training of staff. Nowadays most PFA's of Latin America understand this to be so, but in many cases they still have to know more about issues such as:

- groups of serving staff that need training;
- purposes and subjects in which training is required for these groups;
- institutions, methods of training and assessment of results;
- repetition and periodicity of training efforts.

1/ S.D. Richardson - "Aspects of Forestry Education and Training in Cuba". Havana, 1972. Technical Report of UNDP/FAO project.

Staff members have to be grouped, preferably according to tasks, functions and responsibilities, for example into area chiefs; forest rangers engaged in forest fire fighting; book-keepers and accountants; zonal or regional chiefs, etc. If there are no formal job descriptions grouping has to be based on an analysis of tasks, responsibilities, relations and ranking of staff.

The purposes and subjects for training may include: updating knowledge, diffusing research findings, and introducing new methods. All this serves to improve daily work output and at the same time enhances staff satisfaction and provides greater motivation. It is advisable that for each homogeneous group a complete catalogue be compiled of whatever know-how the PFA's consider necessary, indicating also whether there is any need for professional practice, on-the-job observation, theoretical knowledge, and so forth. It is also advisable sometimes to indicate the most appropriate methods for dissemination of know-how.

The agencies responsible for training should have adequate facilities and high-level teachers, and should tailor their programmes and methods exactly to requirements. In the field of pure forestry, the agencies themselves are normally the ones providing such training; however, for high-level training and for training in specialities it is also advisable to have recourse to external institutions and specialized schools.

The methods and types of training activities may include: short, medium-length and long courses, seminars, symposia, lectures and workshops. Fellowships and study tours are also useful. Usually all the various types of training should be combined. The subjects and activities that have to be studied, which attach much weight to practical training, are covered in the main through on-the-job training. On-the-job training means training under the circumstances in which normal work actually takes place and is therefore highly commendable for work the execution of which depends on actual local conditions. Typical kinds of on-the-job training involve workmen's activities (felling, logging, nursery work, and so forth) and administrative tasks. Nowadays the training centres for forest workers are the ones that offer most on-the-job training. But on-the-job training can also be provided for high-echelon staff.

In order to judge the training methods it is necessary to evaluate achievements. Such evaluation can be done by the training institutions, by the trainees themselves or by the PFA's. What is to be evaluated includes the work performance of staff that has received such training, comparing their work before and after training, the methods and means used for training and the satisfaction derived by the trainees. In some cases results can be measured (amount of felling actually done, and so forth). In other cases it is difficult to establish exact criteria for such evaluation. In any case, it is advisable to make an evaluation not only at the end of the training course, but to repeat it after a certain lapse of time.

The evaluation findings are useful in the revision of the content of training courses and to decide whether or not it is necessary to give repeat courses and at what intervals these should be given. Assessment of staff training is also valuable for development of recurrent training programmes for different groups of officials and workers of PFA's. Many countries already offer regular, periodical courses for workmen and foremen engaged in forestry work. However, it must be kept in mind that manpower training of higher officials is also very important to enhance efficiency. It is therefore to be highly recommended that training programmes be tailored to the needs of PFA staff and manpower at all levels, not neglecting careful costing of such programmes, expected achievements, and implications as regards needs of teaching staff, premises, means and equipment.

4. EMPLOYMENT

4.1

From available information, however incomplete, it is possible to state that PFA's in Latin America generally are not large direct employers of forest workers. FIGURE 29 shows that proportionally the number of workmen is high only in Belize and Jamaica (although the

information received may refer to employment throughout the forestry sector) and only moderately high in Colombia and Ecuador. Some PFA's, like INAFOR of Guatemala, whose statutory task is mainly one of surveillance, supervision and control, do not need large platoons of workmen. Nevertheless, virtually all PFA's do have some task force doing work of forest protection, plantation and utilization. On the other hand, some of them, CONDEFOR of Honduras for instance, are explicitly required to promote employment among the rural population by organizing cooperatives or other types of associations for the care, protection and regeneration of forests (the so-called "forestry social system"). Therefore one should not underestimate the function of generating employment on a large scale that falls to many PFA's of Latin America, given the great employment potential of forestry development, and especially because most forests in almost all these countries (except for Guatemala and Paraguay and to a lesser extent Argentina, Brasil, Chile and Uruguay) are of public domain. An idea of the number of jobs that the PFA's are capable of offering can be gained from the fact that in 1974^{1/} ICOMA of Spain gave direct employment of the order of 3 million man/days.

FIGURE 29

DIRECT EMPLOYMENT OF WORKMEN BY TEN PUBLIC FORESTRY ADMINISTRATIONS

Country	Man/days worked in one year *	Year	Employment trend
Belize **	600,000	1974	+
Bolivia	4,800	1973	+
Colombia	180,000	1973	+
Ecuador	120,000	1973	+
El Salvador	50,000	1973	+
Guyana	20,000	1973	-
Jamaica **	256,935	IV/73 to III/74	+
Nicaragua ***	46,285		+
Paraguay	3,600		-
Uruguay	27,540		-

Source: Replies to the National Questionnaire.

* Data homogenised using the following conversion factors:

8 man/hours = 1 man/day; 1 man/year = 240 man/days.

** This country's report does not specify whether or not these workmen are employed directly by the PFA.

*** INFONAC 85%; Depto. de Dasonomía (Department of Forestry) 15%.

4.2 Employment in the Forestry Sector

Whether PFA's offer direct employment or not, there is no doubt that they should all have a prime promotional function in the development of employment in forestry. The case of CONDEFOR of Honduras already mentioned is one of the most significant in this respect. A CONDEFOR project for forest development, that of the Olancho Reserve, calls for the organization of seven cooperatives, one for each forest management unit, with a joint permanent workforce of 1,670 to 2,580 (depending on the cutting cycle adopted) engaged in operations of forest protection, management, resin tapping and lumbering, in addition to 1,100 jobs for

road construction and maintenance. Each cooperative will further have over 160 to 200 ha. of grassland plus 0.5 ha. of farmland per family, in order to ensure some 3,000 rural families a good standard of living within a forested area of one and a half million ha.

Honduras' case is not unique. An official report of Peru^{1/} states that "its forest resources currently generate only about 80,000 permanent jobs for the tasks of afforestation, timber extraction and primary conversion of timber. At the end of the biennium 1977-78 this figure should have risen to 189,500 jobs for both the private and public sectors. The further development anticipated after 1978 is so great that it can be estimated that over 50% of the active population in forested areas will find direct or indirect work in this sector. By the end of 1980 the extraction of timber from forests - which today forms one link in the most ominous chain of human exploitation that still exists - will have been turned over to a large extent to what one calls today "small" lumbermen and extraction firms properly organized in cooperatives and/or social ownership enterprises; as for the rest of the timber extraction, it will be placed in the hands of a public forest agency, still to be set up, while the rest will remain in the hands of private enterprise". According to Bucarey (op. cit.), the Corporación de la Madera in Chile planned for 1975 the employment of 65,000 workmen, of whom 20,500 in timber processing; 17,300 in silvicultural production; 21,500 in reforestation and 7,200 in the pulp and paper industry.

The total employment potential in the forestry sector in certain countries of Latin America can be gauged roughly by comparison, considering that the employment potential per unit of forest may be somewhere halfway between that of Europe and Asia.

In four European countries (see FIGURE 30) with a combined forested area of 34.2 million ha. (a forested area of the order of that in Colombia or Venezuela), but in a more advanced phase of socio-economic development and with highly mechanized forestry operations, employment in the forestry sector (excluding forest industries) in 1970 amounted to 24.4 million man/days (equivalent to 122,500 permanent jobs). FIGURE 31, which refers to three of these countries, shows the marked trend towards a decline in forestry jobs in the past 15 years, a trend paralleling growing mechanisation.

In India, which has a total forested area of 74.6 million ha. (95% of which is public domain), the total number of jobs in forestry (including forest industries) in 1972 came to a figure of 969 million man/days (equivalent to some 4 million permanent jobs)^{2/}. An estimated one-third of this figure corresponds to jobs in forest operations.

Consequently it appears that under present circumstances in Europe 1 million ha. of forest can provide direct employment equivalent to about 3,600 permanent jobs in forestry operations, whereas in India in 1972 the same area generated about 17,500 permanent jobs. This can be compared with data published by U. Sundberg^{3/} who studied the employment opportunities afforded by forestry operations in Asia. Due to socio-economic conditions in that region, he reached a figure of some 40,000 permanent jobs per million ha. of forests on the basis of intensive stand rehabilitation. On the other hand, B. Frykman^{4/} in studying the forest employment potential in Ghana (whose population density is only 36 inhabitants per km²) projected an equivalent of 4,100 permanent jobs per million ha. by 1985.

- 1/ R. Hooker Leguia and J. Bohórquez Rojas - "Informe del Perú a la Conferencia Técnica de la FAO sobre los Bosques Tropicales Húmedos". Ministry of Agriculture, Lima, 1975.
- 2/ Government of India - Report to the Tenth Commonwealth Forestry Conference, 1974.
- 3/ U. Sundberg - "Forestry Work Operations - Efficiency and Employment Potentials". (Paper submitted to the FAO/IL0/SIDA Symposium on Employment in Forestry, Chiang Mai, Thailand, 1974), FAO, Rome.
- 4/ B. Frykman - Case studies on assessment of manpower needs in forestry operations
1). FAO, Rome, 1971.

FIGURE 30

MANPOWER INPUT IN FOREST MANAGEMENT AND UTILIZATION IN
FOUR EUROPEAN COUNTRIES (1972)

Country	Man/days worked during a year (in thousands)		
	Management	Utilization	Total
Bulgaria	6,576	5,265	11,841
Hungary	3,144	1,546	4,690
Norway	2,045	2,070	4,115
Sweden *	2,475	6,284	8,759
TOTALS	14,240	15,165	29,405

Source: Replies to a questionnaire on employment in the forestry sector for the European Forestry Commission (1975).

* Figures obtained expressing man/hours in man/days, using a conversion factor of 1:8.

FIGURE 31

TREND IN MANPOWER INPUT IN FORESTRY OPERATIONS
(man/days worked in thousands)

Country	1960	1965	1970	1975 (forecasts)
Bulgaria	16,853	12,088	12,607	10,744
Hungary	9,960	7,410	5,170	4,400
Sweden	14,447	13,422	10,360	7,628
TOTALS	41,260	32,920	28,137	22,772

: Replies to a questionnaire on employment in the forestry sector for the Forestry Commission (1975).

of India should be kept in mind, because the system formed by the forest service of the Union, plus the state forest services, has played a great role in promoting employment in forestry work that has expanded greatly thanks to the so-called "forestry social system" and the plans for afforestation.

With all due reservations required in a hypothesis of this kind it seems reasonable to assume that the employment capacity per forest unit in many countries of Latin America will be somewhat higher than that in Europe and lower than that in India. It may be recalled here that B. Strehlke^{1/}, basing his figures on the estimated number of forestry technicians

1/ B. Strehlke - "Vocational Training in Forestry". (Paper presented to the World Consultation on Forestry Education and Training, Stockholm, Sweden, 1971), FAO, 1971.

required in Latin America, given by Shirley and Prats Llauread¹, and applying the suggested supervisory staff quotas of those two authors, deduced that by 1985 about 180,000 foremen and 1,440,000 skilled workers will be needed. In order to reach these figures all countries must fully develop vocational-level forestry training. This work of training should be guided initially by quantitative goals based not on the manpower requirements mentioned above, which give long-term indications only, but rather on the requirements derived from existing plans for afforestation, forest management and production.

CHAPTER V

PLANNING AND FINANCING

1. PREMISES

Dealing with planning and financing in one and the same chapter does not seem illogical, since one of the main purposes of planning is correct allocation and use of financial resources. There are recent examples in Latin America - notably in Honduras - illustrating how strategic and operational planning of forestry development combined with other political and institutional factors have given rise to an abundant flow of public and private funds into the forestry sector.

The planning of national socio-economic development - usually mandatory for the public sector and indicative for the private sector - started in Latin America in the 1960's, practically speaking. This gave rise and impetus to the planning of forestry development, i.e. to the systematic anticipation of forest development activities phased over several years and coordinated with one another as well as with development work in other economic sectors. Still, not always has the forestry sector, or subsector, received attention from planning agencies commensurate with its potential. Although many countries today do have forest development plans, very few of these are detailed and operational, few embrace both public and private investment, and they often fail to pay adequate attention not only to financial resources but also to the institutional set-up and other measures necessary for the successful achievement of goals.

Progress in the field of forestry development planning during the past decade has been partly encouraged by certain advances at world level. For instance, the FAO document "Timber: World Trends and Prospects", presented to the Sixth World Forestry Congress (1966), stimulated planning work, as it presented a general framework which anticipated a 50% increase in the consumption of industrial timber throughout the world and almost 100% in Latin America between 1962 and 1975. The desire to plan the development of this sector made the need to improve organisation and planning methods obvious. The FAO/SIDA Seminar on Forestry Development Planning held in Quito in July/August 1975 and the main document for that seminar^{1/} were helpful in meeting this need as regards Latin America. For this reason, the topic of development planning will not be discussed at length in this chapter, but available information on actual plans for forestry development in Latin America will be presented, including national, sectoral and regional plans. Since planning is part and parcel of virtually all professional forestry work, it seemed advisable to select certain topics especially pertinent to the current situation and requirements of PFA's in Latin America. In particular the following will be dealt with: (i) the concept of planning, emphasizing its general scope and multiple applications in the field of forestry; (ii) the main types of planning of interest in forestry and their goals, not overlooking the oldest and most usual type of plan as far as the PFA's are concerned, namely the forest management plan; (iii) mechanisms and prerequisites for planning; and (iv) two tasks of special interest in the ordinary work of PFA's, viz. evaluation of plans and supervision of their execution.

As regards financing, in addition to synthesizing available information on material means and funds actually available to PFA's, a description will be made of: (i) the usual ways of financing PFA work; (ii) particular ways and means of obtaining financing, viz. establishment of national forest funds, of public forest agencies and enterprises, and

1/ J.E.M. Arnold - "An Introduction to Planning Forestry Development". FAO, Rome, 1975.

adoption of certain fiscal incentives which are gaining special significance in Latin America; and (iii) prospects for greater allocation of funds to PFA's and the prerequisites for this, notably in the areas of forest policy, planning and public information.

2. PLANNING

2.1 The Concept of Planning

The world and the environment in which we live are greatly affected by past planning. We plan in all sectors of life and our plans consciously or unconsciously affect us in all our work. Decision-making and planning are inalienable human capacities.

Planning can be defined as the intelligent selection between alternative courses of action which under existing circumstances seem appropriate to attain certain goals within a set time. The outcome of such selection is the plan. In planning, therefore, the following points have to be considered:

- the objectives;
- existing circumstances;
- possible courses of action to attain the goals;
- criteria for making an intelligent selection among several possible courses of action.

The planning process can be illustrated by FIGURE 32. This Figure refers to a forestry enterprise but similar systems would apply to any type of enterprise.

First, the present situation has to be analyzed. The analysis may, in the case of a forest enterprise for instance, cover the following data: area, tree species and their distribution, soils, volumes, road networks, machinery, manpower and its deployment, organization of the enterprise, physical, technical and economic results, etc. Conditions on the geographical site of the forestry enterprise must also be considered, i.e. both the natural and the socio-economic environment (the timber market, manpower availability, infrastructure, roads, communication facilities, etc.). In addition, legal and administrative restrictions must be taken into account. Certain past events also affect results. These events have to be analyzed, because the knowledge of cause-and-effect relationships may throw light on what activities may (or may not) prove appropriate in the future.

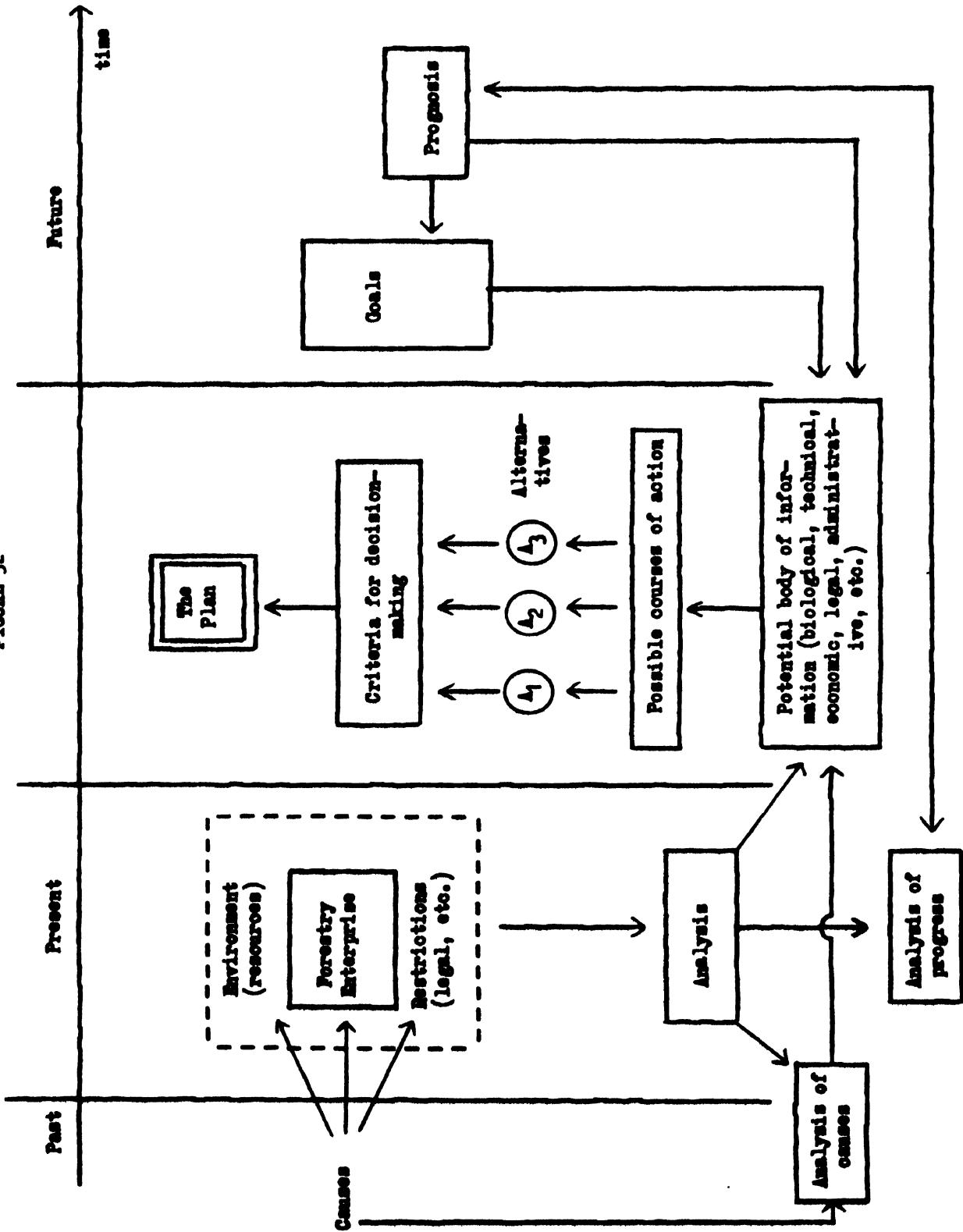
Once an analysis of circumstances has been made, the evolution of the situation has to be analyzed too (trends in the distribution of types of forests, tree species, volume, increment, labour force, markets, economic costs and returns, influences of the population, infrastructure, etc.). As will be seen, all this fund of information will be useful in the attainment of the goals of the forestry enterprise.

The entire potential stock of factual information, including knowledge of methods, is useful in deciding on the most appropriate course of action for attaining future goals under existing circumstances. Normally there will be a wide range of technical measures that can be formulated as alternatives (A_1 , A_2 , etc.). From among these alternatives the one or several will be selected that best fit the criteria on which decisions have to be based. These criteria are derived from the goals set, keeping in mind priorities among them. The outcome of this process of choosing between alternatives will be the optimum plan.

Eight planning phases can be distinguished, namely:

- (1) formulation of objectives (the system of objectives);
- (2) inventory-taking:
 - to determine the current situation of the forest enterprise;
 - to determine how existing conditions affect the work of the forest enterprise;
- (3) analysis of causes as apparent from the current situation;

FIGURE 32



- (4) analysis of how the situation will evolve (trends and prospects);
- (5) finding criteria to be applied in deciding between alternative courses of action;
- (6) formulation and evaluation of alternatives;
- (7) selection of the best alternative;
- (8) detailed development of the alternative chosen.

Normally these eight planning phases cannot be considered separately, as their inter-relationships and link-ups must be kept in mind, with constant feedback being essential.

This definition and these phases of planning are valid for any plan (sectoral, regional, national, management, budgeting, etc.). The differences between plans can be seen in their purposes, courses of action and criteria for decision-making. The term 'planning' and the procedures (planning phases) in use for the preparation of plans are valid in any form of political economy, whether it be the free enterprise system or the planned, centrally organized form of economy. The type of politico-economic system is reflected in the choice of the main objectives, in the criteria used in decision-making and in the setting of priorities (for instance, whether the objectives will be social or economic; whether prices will be fixed or will be those prevailing on the open market; whether optimum profit-making is aimed at through high mechanization, or whether the aim is maximum employment of manpower in the region, etc.).

2.2 Types of Plans

There are several types of plans, but neither in the literature nor in the PFA's do they receive a standard classification. For the purposes of this study, the plans of interest for the forestry sector can be systematized as follows.

2.2.1 Sectoral plans

Sectoral plans refer to the various sectors of the national economy, namely: forestry, agriculture, stockraising, fisheries, tourism, industry, commerce, exports and imports, education, health, etc. As will be seen, several countries of Latin America have sectoral or subsectoral development plans for forestry that normally have many links with other sectors of the national economy. The topics that appear most frequently in the plans for the forestry sector are:

- wood utilization (volume, tree species);
- development of forest industries, wood manufacture and handicrafts;
- exports and imports of timber and/or other forest products;
- reforestation and afforestation; seed and plant production;
- erosion control and watershed management;
- improvement of the environment;
- wildlife (and sometimes fisheries);
- creation of national parks and nature protection;
- forest inventorying;
- scientific research;
- investment;
- forestry education and public relations.

The ideal thing would be to frame plans for the forestry sector based on a nationwide inventory of all forests and woodlands and on the results of forest management plans. But up to now the plans for the Latin American forestry sector could not be based on really satisfactory data.

2.2.2 Regional plans

The main purpose of such plans is socio-economic development within well-defined geographic areas, the prerequisite being a regional zoning of the country. For the purpose of zoning, various criteria are utilised in describing a set of physical, climatic, demographic, historical, social and economic factors. Nowadays quantitative geography methods are available that, through using thematic maps, permit very clear delimitations of the various regions.¹⁾

The main aim of regional planning is the greater socio-economic development of a region for human welfare and in the interests of the national economy; this presupposes proper integration of all sectors. In this connection, the forestry sector has a very important role, especially in less developed areas, primarily in connection with manpower employment, the production of timber as a raw material for various industrial sectors, and the protection of agriculture and waterheds. Also important in this connection is the fact that a great part of forestry work calls neither for large investment nor for highly skilled labour. Consequently, forestry can play a key role in the early phases of regional development.

2.2.3 National plans

National plans are concerned with socio-economic development at the highest level, integrating all aspects of society and of the economy. National plans are all the more effective the better they are coordinated and harmonized with sectoral and regional plans. For such coordination a clear policy is needed as regards priorities among objectives and realistic prospects for achieving them, taking into account any requirements regarding physical, financial and manpower resources.

In actual fact, the forestry sector should occupy an important place in the national plan. However, when analysing national plans now in force, one finds that many have only little space devoted to it. Sometimes, what appears in the national plans is not consistent with the contents of the sectoral forest plans. Hence it is of utmost importance to work out plans for the forestry sector carefully, realistically and in a coherent manner, so that they can be readily integrated into the national and regional plans without incompatibilities or contradictions.

The institutions or persons who prepare national, sectoral and regional plans are usually not the same. Thus the implementation of plans may be very problematic. Plans are often based on different information and criteria, and the purposes set are different. Therefore, the results, goals, methods and techniques of execution require different means. When plans are inconsistent, there is a risk that execution will be wanting and there will be conflicts of competence; the result is failure, with consequences normally falling back on the PFA. That is why it is of fundamental importance that the plans be well thought out.

In addition there is the problem that national, sectoral and regional plans are only rarely coordinated with those of private forest owners. Frequently the owners do not know of high-level government plans or do not follow them in their own activities. In other words, the intentions of official forest policy are not fulfilled in practice. These discrepancies and divergencies could be reduced if governments publicized national, sectoral and regional plans better, informing forest owners of them through special information services of the PFA or in the course of providing technical assistance. Other means for stimulating certain forestry activities among forest owners according to the plans are tax incentives, special lines of credit and subsidies.

2.2.4 Management plans

Such plans embrace all technical, economic and social activities of any entrepreneurial venture in accordance with long-term (5-10 or 20 years) objectives. The entrepreneurial unit may coincide with the land area of the forest holding or, in the case of vast estates (national, communal or private), it may coincide with the territorial jurisdiction of the administrative divisions. Usually a forest enterprise is managed by a person holding a degree in forestry; its geographical expanse varies greatly (reaching up to several thousands of hectares in size). Normally, in order for annual tasks to be performed on a continuing basis and with a relatively stable output, large tracts of land are necessary; in other words, the size of the forest must be such that it is possible to apply the principle of sustained yield.

The work covered in the management plan should include:

- felling, sawing and haulage of timber;
- reforestation, afforestation, natural regeneration, and seed and plant production;
- cultural care and thinning;
- road building and maintenance, and opening of haulage routes;
- forest protection;
- construction and maintenance of buildings;
- soil improvement;
- purchase, installation and maintenance of machinery, car pools, implements and materials;
- installation, maintenance and management of parks;
- torrent control and soil protection against erosion;
- marketing and/or processing of timber.

Management plans also cover techniques to be applied and means of execution, including manpower. In addition to coordinating all these activities, the plan can analyze the budgetary requirements and economic results as well.

Many private ventures do have management plans, especially in vertically integrated industries that own both forest land and industrial plants, as for instance pulp and paper industries. However, up to now management plans have not been a thing and instrument in Latin America. Apparently only Chile has recently made it obligatory for management plans to be presented for all holdings whose owners wish to avail themselves of tax incentives (Decree-Law No. 701 of February 1975). In other countries plans must be submitted for special purposes, as for instance reforestation plans, in order to take advantage of fiscal incentives (Brazil).

A very significant advantage of generalizing the practice of preparing plans - possibly for approval by PFA's - would be not only the sound management of stands, but also the laying of firmer foundations for the framing of regional, sectoral and national plans. To that end it is recommended that the legal grounds for such management plans be provided. As a first step it is advisable to determine the requirements for such plans (inventories, felling plans, reforestation work, methods for appraisal of potential cut, etc.), excluding activities that can damage the environment and that do not contribute to the national economy.

2.2.5 as of plans

2.2.5.1 The functional plan

The term "functional" refers to the formal structures of planning. This is why any plan (national, sectoral, regional, etc.), including the forest management plans, can be a functional one. Adjusting planning work to a functional structure is useful and logical because it ensures full consideration of the problem and renders the evaluation of the plan easier.

Plans of the functional type involve three steps:

- framing of the plans;
- implementing their execution, including:
 - planning of necessary operations and flow of operations;
 - planning to meet manpower and material requirements for execution of works;
- costing and planning of output.

In the first stage all activities (i.e. the various tasks included in the management plan) are programmed. In planning the necessary tasks, the most appropriate techniques and methods for the execution of each programme are spelled out. This stage is basic for estimating manpower and materials requirements on which costing will be done, and output figures derived will be incorporated in the preliminary budget. By comparing these figures with the approved budget it will be possible to revise plans and schedules and plan the operational tasks; in other words, the plans are thus adapted to actual circumstances.

Modern computers allow a practically unlimited repetition of functional planning, facilitating the drawing up of several simultaneous plans and the immediate spotting of plans that are not feasible.

2.2.5.2 Overall and detailed plans

A distinction is made between the general plan and the detailed one based on the degree of elaboration. As a rule, the national plan is a general one that cannot go into all the details of execution. A general plan leaves many concrete decisions to lower-level staff, which means that properly trained and experienced staff are necessary for its execution. A management plan is already a rather more detailed one.

2.2.5.3 Work plan and contingency plan

Apart from the actual work plans, contingency plans may be drawn up. Under normal circumstances the persons responsible carry out the work plan. Should emergencies arise (due to fire, very low prices, bad weather, etc.), a substitute contingency plan that has been drawn up in advance to meet simulated situations of this kind may be put into effect.

2.3 Purposes of Plans

The term "purposes" refers to the combination and hierarchical set-up of all requirements that the unit has to meet in the future in order to serve the public or private landowner, the national economy and/or local communities. The purposes or goals have a normative dimension corresponding to the policy of which they are the expression and which they define for a given body or area (the government, parliament, the public administration, a community or a private owner, etc.).

Another distinction is made between substantive goals and formal objectives. The latter determine the manner in which the substantive goals are to be attained. The economic principle, the principle of rationality and the principle of sustained yield are examples of formal objectives. The substantive goals may be divided as follows:

- Goals pertaining to economic products and services;
- human welfare and social goals;
- monetary/financial goals;
- physical safety goals.

We now give a selected list of subjects which concern the purposes of plans in the forestry sector (and in forest enterprises).

Products and services

Forest trees (various species)	Recreation
Forest products of various kinds and properties	Tourism
Different degrees of processing of timber products	Water supply (quantity, quality)
Wildlife	Soil protection against erosion
Hunting and fishing	Purification of the air (environment)
	Servicing of third parties (for instance technical assistance)

Human welfare and social goals

Employment	Social communications
Accident insurance	Sickness and old-age insurance
Health	Rights to vacation and recreation
Adequate housing	Sports
Schools	

Monetary/financial goals

Cash returns	Productivity
Business turnover	Coverage of expenses
Profitability	

Physical safety of the unit

Formation of physical and/or financial reserves	Insurance
Liquidity	Fire-fighting services
Minimum capacity (manpower, machinery, etc.)	Multispecies, mixed stands

The persons in charge may choose *a priori* from among several possible objectives, always investigating the operational feasibility of attaining each goal as well as all of them combined. The feasibility of attaining a certain objective is determined by: (a) the deadline for reaching the objective; (b) the positive assurance of its feasibility; and (c) the measurability of attainment of the goal.

The setting of deadlines is a prerequisite for feasibility testing and provides the basis for control. Testing of feasibility includes making an analysis of the clarity of the objectives, their conformity with existing circumstances and the contradictions or competition among various goals. With regard to this final point, different goals may be either neutral vis-à-vis each other, harmonious, contradictory or competitive. If the relation is neutral, no problem exists. If the goals are in harmony, one will reinforce the other. In case the goals are contradictory, a clear decision must be made as to which is to be eliminated. In case the goals are competitive, the achievement of one will go counter to the achievement of the other (for instance, the large-scale expansion of conifer stands entails lowering the water supplies in watersheds, and vice versa). In such case a decision will be necessary as to which goal deserves priority as well as what minimum of attainment of the less important goal has to be achieved. Thus, in case priority is

attached to the water supply, a decision may be taken to restrict the expansion of conifer stands up to a certain area.

As regards the criterion of measurability, obviously a logical point, it should be noted that normally it must be possible to take measurements (for instance, using the metric system or the CGS system). However, it may suffice to be able to take measurements on an ordinal scale, i.e. to determine of two things that they are equal, or that one is bigger or smaller than the other.

2.4 Planning Institutions and Prerequisites

Annual plans, including draft annual budgets for any forest unit (whether it be a forest district or other) normally come within the competence of the forester in charge. The proposals for these annual plans are almost always subject to approval by landowners or a higher office (the regional office, zonal office, etc.). Such approval will not only depend on checking calculations but also on on-the-spot inspection based on random checks of the justification of the work plan and of its feasibility. The set of plans revised and approved by the PFA then becomes the basis on which national-level plans can be prepared. Once the annual national forestry programme has been approved, the final version will be communicated to the regional (or zonal) levels and then to the local levels (for individual forests or forest units) where the proposed programmes will be revised to fit into the approved overall plan.

If management plans exist, the annual plans for each forest unit must refer to them. In other words, the annual plan is a phase in the execution of the management plan. The preparation of each management plan should result from cooperation between the head of the unit and a planning expert (the planner). It is neither feasible nor proper for the head of the unit to prepare a management plan all by himself. Aside from the fact that he does not have enough time to do so, he normally cannot possess all the specialized know-how required for inventory-taking as well as for applying all planning techniques. So there should be a specialized service within the PFA for the preparation of management plans^{1/}.

Planning at the highest level (regional, sectoral and national) also requires special bodies. For regional planning there is normally a planning board (office or division) within the public administrations of the provinces, zones or states. Sometimes there are foresters on the staff of these public agencies or collaborating with them. In Peru the "Oficina de Programación" of the "Dirección General Forestal y de Fauna" supports and assists the agricultural zones in the framing of policy and in determining what contribution forests are supposed to make to regional development. In certain cases (e.g. Ecuador) autonomous or semi-governmental agencies are responsible for regional plans; these agencies function as advisory commissions for regional planning. These commissions are composed of experts drawn from various sectors of economic and social life.

The preparation of sectoral plans may be left to the PFA itself or else to a specialized division of the Ministry of Agriculture or some other ministry ("Departamento Nacional in Colombia and "Junta" in Ecuador) responsible for planning at the national level (sectoral and national plans). In Peru, in 1962, the "Oficina Nacional de Evaluación de Recursos Naturales" - ONERN (National Office for Assessment of Natural Resources) was set up as a decentralized agency of the Office of the Presidency under the control of the Prime Minister.

ONERN's stated purposes are:

- "(a) to conduct integrated surveys of the natural resources of Peru for the purposes of economic and social development;
- (b) to collaborate with the Instituto Nacional de Planificación in the framing of policy for resource use and conservation; and

^{1/} See the FAO report on the organization of the forest planning service in CONAF, Chile. CHI 26/71, Rome, 1973.

- (c) to study at the national level man's interdependence with the natural environment, proposing alternative courses of action for the preservation of a wholesome environment."

ONERN is technically and administratively autonomous in seeking to achieve these purposes. It is responsible for planned inventorying and assessment of Peru's resources in the light of national and regional development plans. In addition, ONERN compiles and evaluates basic documents for the programming of development and furnishes technical assistance to other government agencies in the field of research and assessment of natural resources. ONERN's first surveys and studies were done in the forestry sector.

In assessing institutional alternatives for planning at the highest levels (regional, sectoral and national), the implications of various institutional solutions have to be appraised with reference to:

- specific professional knowledge;
- the combination of planning tasks with current workload;
- the overall view, possibilities for coordination and consistency of plans;
- the independence from private interests or group interests;
- planning methodology;
- bringing points of view of interested parties into harmony;
- costs and benefits.

Normally it is the staff of any PFA that is most knowledgeable about the situation in the forestry sector and about appropriate techniques, etc., but the workload involved in continuous planning is so great that PFA's need at least special sub-divisions or sections to cope with this specific task. Such units or sections must maintain permanent liaison with similar ones in other sectors of the Ministry of Agriculture and also with planning bodies in other ministries in order to ensure coordination and consistency of regional, sectoral and national plans and the conformity of such plans with general policy. Apparently the need to comply with other criteria (independence, standard methodology) favours the solution of having such planning done outside the various ministries, that is it argues for integrated regional, sectoral and national planning by some special planning body outside of the ministries. In the long run this solution probably offers the best cost/benefit ratio. One very important problem in all high-level planning is the participation of the interested parties, that is to say, of representatives of the various sectors of the economy and society. The execution of plans will be all the more efficient, the better know-how, experience and support of the authorities of these sectors can be incorporated. That is why it is very useful to analyze the possibility of setting up consultative commissions for planning agencies, composed of sector representatives able to exert a positive influence on the execution of the said plans.

It is also necessary to meet certain prerequisites for expediting the framing and execution of plans for the forestry sector, of whatever type they may be.

Moreover, it is necessary to define what is meant by the forestry sector and to lay down an operational forestry policy integrated in the overall policy and especially in the policy governing the use of natural resources. The guidelines and standards according to which land is declared suitable for forestry only, whether or not it is actually under forests, hinges on this policy. Once these standards or criteria have been approved -- for all types of land use -- the bases are laid for delimiting the forest area for the future. Among these criteria one can discern those applying to protection forests, to forests in watersheds, to forests and parks open for recreational purposes around cities, etc. Countrywide aerial photography inventories provide data that can be transposed onto maps and rechecked in the field. These findings are registered in special land records and publicised among landowners. Only on such a clear and sound basis can any long-term planning be done. All this requires appropriate forest laws and decrees (see, for instance, Chile's Decree-Law No. 701). Also required are legal prescriptions and rules and regulations governing necessary and/or prohibited operations in various types of woodland and forests (for instance, reforestation or compulsory afforestation of suitable land by

a certain deadline or the prohibition of clear-cutting in protection stands).

When there is a great demand for recreation areas in the vicinity of urban centres it may be necessary to compel landowners to allow public access to forests. The opening of protective firebreaks, especially in large softwood plantations, is essential. If management plans are to adhere to the principle of sustained yield it will be necessary to stipulate appropriate methods to determine the feasibility of such management. Many private owners do not possess enough technical knowledge in the field of forestry. They will therefore be unable to comply with the said rules and regulations. In other words, it is essential to have a good technical assistance service when such requisites are laid down.

2.5 Quantitative Evaluation of Plans

When plans are being framed, all alternative ways of achieving the purposes need to be considered. Choosing the best alternative means evaluating and comparing all possible ways for achieving the goals set. Technical judgement is not enough for comparison of alternative courses of action. A uniform scale for such comparison, using criteria derived from the purposes themselves, is required. It is very difficult, if not impossible, to devise such a scale in which, as far as possible, each feature is quantified and the weight of non-quantifiable objectives judged. This is usually accomplished by expressing the extent to which each criteria is met in terms of relative weights, as shown below in FIGURE 33a.

FIGURE 33a

ASSESSMENT OF ALTERNATIVES FOR A MANAGEMENT PLAN

Sequence of Criteria	Criteria	How well the alternatives meet the criteria set			
		A	B	C	D
1	Work force employed	3	1	4	2
2	Social amenities provided	2	1	4	3
3	Contribution to infrastructure-building	1	3	2	4
4	Ensuring supplies to industrial plants	2	1	4	3
5	Total cost	1	3	2	4
6	Other factors				

The principal objective of maximum employment is rated first (1) in the vertical column; this figure and that attached to the other criteria express the priority rating of the objectives. There are four alternative courses of action (A, B, C and D) for attainment of the goals. Alternative B allows attainment of the "maximum employment" objective with the best results (first line across); then follow, as far as this goal is concerned, the alternatives D, A, and finally C. For each row across, a weight can be assigned; for instance, rows 1, 2, 3 and 4 can be assigned weights 4, 3, 2 and 1. Normally weights are also assigned to vertical rows in accordance with the estimated significance attached to each criterion. In this example, vertical row 1 can be assigned weight 5, weight 4 to 2, weight 4 to 3, weight 3 to 4, and weight 1 to 5, etc.

Applying the said weights, we get the following figures:

FIGURE 33b

Vertical rating		Criterion	Horizontal weight *			
Sequence	Weight		A	B	C	D
1	5	Work force employed	10	20	5	15
2	4	Social amenities provided	12	16	4	8
3	4	Contribution to infrastructure-building	16	8	12	4
4	3	Supplies to industrial plants	9	12	3	6
5	1	Total cost	4	2	3	1
		Other factors				
Total weight			51	58	27	34
Total rating			2	1	4	3

Depending on the priority attached to each of the various objectives, and also considering the rating as far as attainment of each objective is concerned, (horizontal rating) the sequence of alternatives is B, A, D and C. This means that alternative B fulfills the combined objectives and meets the set of criteria best.

Another illustration is given below; it shows the internal method of Colombia's Departamento Nacional de Planeación for the evaluation of projects financed with foreign aid (FIGURE 34).

FIGURE 34

INTERPRETATION OF SCALE FOR CORRELATION OF PROJECTS
WITH EVALUATION CRITERIA (COLOMBIA)^{1/}

Criteria	Weights ^{2/}			
	0	2	4	6
A. Economic Criteria				
<u>Subgroup I</u>				
1. Cost/benefit ratio, internal rate of return		x		
2. Foreign credit incorporated			x	
<u>Subgroup II</u>				
3. Expansion of production capacity		x		
4. Enhancement of productivity	x			

^{1/} Excerpt from a document of the Departamento Nacional de Planeación.

^{2/} Weights 0 - 2 - 4 - 6 correspond to findings as regards scope: low, medium, high and very high or nil, significant, important, very important.

(Fig. 34, continued)

<u>Subgroup III</u>				
5. Meeting priorities set in the development plan (for the sector)				x
6. Transfers to other sectors		x		
7. Impact on balance of payments		x		
8. Regional integration	x			
<u>B. Social Criteria</u>				
1. Direct and indirect generation of employment			x	
2. Generation or extension of basic services (health, housing, education)		x		
3. Redistribution of income			x	
<u>C. Operational Criteria</u>				
1. Freedom in use of funds				x
2. Financial aspects		x		
3. Extent to which domestic investment is attracted			x	
Sum	2	6	4	2
Sum x weight	0	12	16	12
<u>Total weight</u>		<u>40</u>		

The first column gives the criteria to be considered in this evaluation. The other columns show the extent to which the goals are attained. In this illustration it is not necessary to decide on the horizontal rating for each alternative. So it may occur that a "good cost/benefit" ratio is reached by the use of more than one alternative.

Another difference between the system of Colombia's Departamento Nacional de Planeación and the first example is that in the former no different weights (or priorities) are established for the sub-groups. FIGURE 34 shows how an alternative can be evaluated. The same calculations have to be made for all others and the sums of the weights must then be compared.

2.6 Control of Execution of Plans

Control is a part of planning, because the comparison of results anticipated with results actually achieved is extremely important for improving information and revising future plans. Discrepancies between planned figures and actual results of execution stimulate the analysis of why these have occurred. There can be many reasons, for instance:

- use of the wrong techniques;
- defective machinery and instruments (due to poor maintenance, for instance);
- timber losses or waste;
- use of incorrect data in planning (poor methods);
- poor quality of material (seed, plants, construction material);
- poor estimates of manpower and material requirements;
- budgetary constraints;
- incorrect estimates of costs, prices, etc.;
- lack of coordination of related tasks;

- lack of current monitoring and communication;
- inadequate training of workmen, mechanics, etc.;
- lack of competence of the administrative staff, of the chief, etc.

To make control easier it is recommended that a system of indices and significant figures be used. A comparison of these figures and indices with those of previous years, or of comparable units, will show trends and point out discrepancies requiring analysis.

Systematic, constant control and its findings can be based on a Management Information System (abbreviated MIS). This MIS can be so organized that all inventories can be automatically checked out. It also gives an idea of available capacity and allows for the setting up of in-service trials for the improvement of techniques and methods.

It should be regarded as a permanent principle that the main purpose of control is to improve work. Control is not primarily an instrument of staff surveillance in order to detect errors committed. Most Latin American countries have well developed systems of budgetary control, but supervision to improve forest management or to effect savings and ensure the flow of information is still little developed.

2.7 Current Plans for Forestry Development

We have already discussed plans for forestry development (see points 2.2.1 and 2.4 of this chapter), indicating their general contents, who prepares them and what prerequisites are necessary for their preparation. We now return to this topic to present succinct information gathered on current plans for forestry development in Latin America. Most countries of the region now have forestry development plans either being implemented, already prepared or in course of preparation. As a rule these plans are part of broader, general plans for nation-wide socio-economic development. Some countries translate their national policy objectives into annual plans which are not incorporated in overall forward planning. Others have forestry development projects, some of them covering several years but not formally part of a plan covering the entire sector.

In reply to the National Questionnaire, several countries supplied information pertaining to their forestry development plans. This information is summed up in FIGURE 35^{1/}. The plans of Argentina, Colombia, Chile, Mexico and Peru are noteworthy either for the vastness of their scope or for their advanced methodology. Argentina's plan is outstanding for the great impetus it gives to the pulp and paper industry and because of the coordination of the activities of IFONA with those of the provinces in the execution of the plan. Colombia's plan is notable for the creation, on private initiative, of the "Corporación Nacional de Investigaciones Forestales" - CONIF, a semi-governmental body with 50% participation of INDERENA. CONIF provides the institutional set-up for fostering forestry research, afforestation and socio-economic development of areas where lumbering is being done. Chile's plan is noteworthy for a treatment of regional development that implies a refined methodology for planning and an advanced coordination machinery capable of creating and executing multisectoral projects. Mexico's plan, the so-called National Forestry Development Programme, is an instrument for planning, diagnosis, promotion and fostering of federal, state and private forestry. Due to its features of continuity and involvement of the people, this is a real institutional instrument for the development and utilization of forest resources for maximum social benefit. Finally, the National Forestry Development Plan of Peru (1974-80) is not only remarkably ambitious for its material goals, but also for its institutional and structural features. It aims at incorporating effectively the forestry subsector in the economy of the country.

1/ Some data in this Figure were kindly provided by participants in the FAO/SIDA Seminar on Forestry Development Planning (Quito, 30 June - 8 August 1975).

FIGURE 35

FORESTRY DEVELOPMENT PLANS IN LATIN AMERICA

COUNTRY	Status of the Plan	Years in Force	Investment (in millions of the national currency)	Main Features
ARGENTINA	in effect	1974-77	54,268.0	Part of the Three-Year National Plan. Calls for afforestation of 200,000 ha., an increase in annual roundwood production from 9.5 to 12.7 million m ³ , a major effort to bring about industrialization (that should absorb about 95% of the planned investment) and cooperation of IFONA with the provinces.
BELIZE	prepared	1974-76	2.4	Part of the National Plan. Covers forest conservation, stand working and marketing of timber. Includes administrative and educational improvements.
CHILE	in effect	-	-	Includes forest plans made consistent with those of other sectors through regional development projects.
COLOMBIA	prepared	1975-79	478.4	Fosters forestry research and supervision over forest utilization, inventorying, standardization of industries and marketing research. The central planning agencies are the Consejo Nacional de Política Económica (National Political Economy Board) and the Departamento Nacional de Planificación.
COSTA RICA	in effect	-	-	Part of the National Development Plan.
CUBA	in effect	annual	-	Consists mainly of annual plans for reforestation, prepared under the direction of JUCEPLAN, taking into account manpower resources.
ECUADOR	in effect	1973-77	481.4	Calls for reforestation of 50,000 ha., better silvicultural treatment and utilization, as well as fostering of training and experimentation.
EL SALVADOR	in effect	1973-77	79.6	Part of the agricultural sector plan is dedicated to conservation and proper management of forest resources, development of specific areas, land classification and promotion of agro-forestry communities.

.../...

(Fig. 35, continued)

COUNTRY	Status of the Plan	Years in Force	Investment (in millions of the national currency)	Main Features
GUATEMALA	in effect	-	-	Part of the National Development Plan and includes sub-projects for reforestation as well as others as part of the programme for conservation of renewable natural resources.
GUYANA	in effect	1972-76 1975-80	13.0 9.0	Calls for the development of forest industries as part of the General Plan.
HONDURAS	in effect	1974-78	173.2	Part of the National Development Plan (Consejo Superior de Planificación Económica [Higher Board for Economic Planning]).
MEXICO	in effect	1973	6,000.0	A permanent plan for the diagnosis, promotion and fostering of regional forestry development. There are support projects for institutions and education.
NICARAGUA	in effect	-	-	Partial plans for forestry development of the Atlantic Zone for which INFONAC is responsible.
PARAGUAY	in effect	1971-75	-	Part of the Five-Year Plan. Calls for completion of the forest inventory, better utilization and intensified reforestation work.
PERU	operational (biennial) prepared	1975-76 1974-80	363.0 9,379.0	As part of the Agricultural and Forestry Plan, the plan already being executed is devoted mainly to the development of the National Forests of Humboldt and Iparia. The 1974-80 Plan calls for 500,000 ha. of plantations, the creation of 164,000 jobs and effective incorporation of this sub-sector in the overall economy.
URUGUAY	in effect	-	-	Partial plans calling for reforestation and development of priority forest areas.

Note: Bolivia, Panama and Venezuela too are preparing forestry development plans.

3. FINANCING

3.1 Usual Means of Financing

Governments finance forestry development through a variety of instruments and measures ranging from direct investment to opening of credit lines, tax exemption and other incentives whether economic or other. This topic was recently dealt with by L. Velay^{1/}. We shall now discuss this range of financing instruments, but shall deal mainly with forestry work conducted by governments through their PFA's and funds administered mainly by them, which comprise only a part of government financing of forestry development.

As has been seen, the PFA's have multiple functions that require complex financing systems. The provision of services, surveillance missions, entrepreneurial work, infrastructure-building, care of natural resources and the creation of new resources are functions that cannot all be financed in the same manner. On the other hand, the various activities of the PFA's need to be organized in accordance with long-term planning, the monetary and financial returns for which can only be expected after a great lapse of time. This explains why funding out of annual government budgets is not considered sufficient for the purposes of PFA's. This is the reason why special ways and means for financing have been evolved for them.

The main types of public financing of forestry programmes are^{2/}:

(a) Government budgets

- as part of regular appropriations;
- as extraordinary budgets appended to the general budget;
- through allocation of public revenue specifically for expenditure in forestry.

(b) Autonomous funds

- i) as part of funds for general economic expansion (Economic Development Plans, etc.);
- ii) as funds allocated exclusively for forestry (National Forest Funds).

(c) Credit institutions

- i) government-backed banks (agricultural credit banks, etc.);
- ii) government agencies.

(d) Indirect aid

- i) tax exemption, special fiscal regimes;
- ii) education, technical assistance, extension work;
- iii) research.

FIGURE 36 shows total funds made available to 16 PFA's in Latin America in 1973 according to data supplied in response to the National Questionnaire. From this Figure it appears that the most usual form of financing of these PFA's consists in making treasury funds available, as is usual for other public administration services. This is done primarily by allocations in regular annual national budgets. In some instances these regular appropriations are supplemented by special funds also allocated out of the public treasury. Many PFA's are authorized to lump together budgetary allocations with income derived from their own forest resources or from other sources, often deposited in a forest fund.

L. Velay - "La Organización Administrativa Forestal en Países en Vías de Desarrollo" (The Administrative Forestry Organization in Developing Countries). Paper for the Seminar on Modernization of the Public Administration in the Forestry Sector of Latin America, Lima, Peru, 1975.

2/ J. de Vaissière - "Éléments de politique forestière". Doc. FAO/SCN-65/7. Ann.1, FAO, Rome, 1965.

FIGURE 36

LATIN AMERICA: TOTAL FUNDS AT THE DISPOSAL OF 16 PFA'S IN 1973

COUNTRY	Monetary units	Available funds (in national currencies)	Remarks
ARGENTINA	peso	82,300,000	Carryover : 48,000,000 Carryover of the budget: 21,000,000
BELIZE	Belize dollar	1,171,970	For investment: 625,686
BOLIVIA	peso	5,871,771	2,508,680 out of the government budget; the remainder out of its own funds
CHILE	escudo	1,901,305,360	25% for current expenditures; 65% for operational expenditures; 10% for capital expenditures.
COLOMBIA	peso	38,810,000	75% out of the budget; 25% out of its own funds
COSTA RICA	colon	5,491,377	2,860,187 out of the Forest Fund; the remainder out of the budget
ECUADOR	sucre	20,023,361	100% out of the budget; 8,333,464 for zonal development
EL SALVADOR	colon	1,331,619	100% out of the budget; for investment: 805,000
GUATEMALA	quetzal	400,000	Approximate figure
GUYANA	Guyana dollar	751,900	100% out of the budget
HONDURAS	lempira	146,200,000	(in 1974): 141,100,000 from its own sources of income; anticipated net profit: 25,400,000
JAMAICA	Jamaican dollar	4,279,427	For administration purposes: 1,118,210; the rest for development purposes
MEXICO	peso	256,200,000	(in 1974): 192,500,000 for investment, including 19,000,000 out of the Forest Fund
NICARAGUA	cordoba	977,440	(in 1975): for the entire RNR, excluding funds from the INFONAC
PERU	sol	47,996,000	For the most part out of the budget
URUGUAY	peso	36,000,000	

Source: Reports in reply to the National Questionnaire.

In some countries there has been a trend towards increasing the funds for the PFA's. For instance, the trend in El Salvador between 1971 and 1975 is shown below:

Year	Operational expenditures (in colones)	Investment (in colones)	Total
1971	169,500	164,400	333,900
1972	253,413	541,240	794,653
1973	526,619	805,000	1,331,619
1974	772,393	1,360,000	2,132,393
1975	691,361	1,387,500	2,078,861

On the other hand, certain forestry development plans (see FIGURE 35) also reveal this trend towards increasing funds. Especially significant is Peru's Forestry Development Plan for 1974-1980, which calls for a very considerable increase in the work of the PFA and in the financing of the development of the forestry sector. No doubt there are other cases in which the financing of PFA's appears to have become stabilized or levelled off. In fact, from available data it is not possible to deduce that there is a general trend towards increasing the financing of PFA's, especially if one considers the impact of inflation.

By way of illustration, FIGURES 37 and 38 give recent figures on the financing of PFA's in West Africa (whose work is centred on the production of commercial timber)^{1/} and in Spain (whose PFA has very diversified functions)^{2/}.

FIGURE 39, which also presents data culled from the replies to the National Questionnaire, reflects the main specific responsibilities of 12 PFA's in Latin America today. Even though, as shown in FIGURE 36, allocations are large in certain countries, a comparison of FIGURES 36 and 39 shows unequivocally the limited, and in some cases the truly miniscule, funding allocated for the tasks that the PFA's are to perform. Considering the total area under forests in Latin America, it becomes all the more patent that by far the majority of these PFA's - with some rare exceptions, Honduras for one - need considerably better financing than at present in order to fulfil their long-term functions. In this regard it is worth recalling, so as to get an idea of the magnitude of the investments required in forestry and the forestry sector in Latin America, that, according to FAO's Indicative World Plan, target investments should in the period 1962-1985 amount to US\$ 1,013 million in forestry and US\$ 4,668 million in forest industries (on the basis of 1962 prices), respectively. These estimates - which are almost ten years old by now - are no longer accurate, but do give an idea of the order of magnitude of the promotional and catalyzing function of investment, even if not direct investment, that the PFA's in this region ought to fulfill.

In West Africa, budgetary appropriations for PFA's range from 0.5 to 1.5% of the total national budget, apparently quite independently of returns from log production. The case of Spain's ICONA is interesting as a reference, considering that this agency receives about US\$ 88,000,000 per year mainly to administer and improve 4 million ha. of forest land, to protect another 5.3 million ha., to maintain surveillance over another 2.5 million ha. and to reforest still another 70,000 ha.

1/ F. Schmithüsen: op. cit.

2/ ICONA - Reply to the FAO National Questionnaire. Madrid, 1975.

FIGURE 37

PUBLIC EXPENDITURE ON FORESTRY ADMINISTRATIONS COMPARED WITH THE TOTAL VALUE OF LOG PRODUCTION, THE TOTAL GOVERNMENT BUDGET AND INCOME FROM FOREST TAXES (1973)

(Amounts in millions of CFA francs [US\$ 1 = 225 CFA francs])

COUNTRY	Total value of logs produced (1)	Total expenditure on forestry administrations (2)	(2) in % of (1)	(2) in % of budget	(2) in % of income from forest taxes
CAMEROON	13,000	360	2.8%	0.50%	15% ^{1/}
CONGO	14,000	350	2.5%	1.50%	30% ^{1/}
IVORY COAST	63,000	1,079	1.7%	0.87%	12%

^{1/} Estimated 1974 figures.

FIGURE 38

FINANCING OF THE INSTITUTO NACIONAL PARA LA CONSERVACION DE LA NATURALEZA
(NATIONAL INSTITUTE FOR NATURE CONSERVATION)

(Spain, 1974; US\$ 1 = 57 pts.)

Source of funds	Funds made available to ICONA	
	in millions of pesetas	equivalent in millions of dollars
Government budget (for investment purposes)	3,854	67.61
Government budget (for expenditures)	283	4.96
ICONA resources	585	10.26
Revenue from enforcement of the laws on forest, hunting and fishing	294	5.16
TOTALS	5,016	87.99

FIGURE 39

LATIN AMERICA: FOREST LAND ADMINISTERED BY, OR UNDER THE CONTROL OF, PFA'S
(Areas given in 1,000 ha. units)

COUNTRY	Public Forest Land		Private forest holdings protected and/or under PFA trusteeship (3)	Remarks
	Area directly administered by the PFA (1)	Other land for which the PFA is responsible (2)		
ARGENTINA	18,150	39,000	20,850	The PFA is responsible for protection of land under (2)
BELIZE	477.6	359.5	810.2	The PFA is responsible for protection under (2)
BOLIVIA	2,400	42,489	. .	The PFA is responsible for control under (2) and (3)
CHILE	12,261	-	10,450	
COLOMBIA	45,200	-	6,000	The PFA is responsible to a very limited extent under (3)
COSTA RICA	648.4	35	. .	Public forest land is estimated at 1,900,000 ha.
EL SALVADOR	32	-	2,000	(3) includes all private forest holdings
GUYANA	2,000	1,819.7	-	50,000 ha. of private forest holdings
JAMAICA	109.6	-	0.8	
MEXICO	1,011.5	-	43,497.2	(1) includes national parks and other public domain
PARAGUAY	0.7	439.3	. .	The PFA is responsible for control under (3)
URUGUAY	14	12	. .	The PFA is responsible for care under (3)

3.2 Special Ways and Means of Financing

Among the main purposes pursued with special means of financing are reinvestment in the forestry sector of some of the earnings from forest utilization and the achievement of some financial autonomy with implicit flexibility and continuity of investment in forestry development under the general rules governing public funding.

The idea of reinvestment of a portion of the returns from stands in forestry dates way back. Spain's Law of 11 July 1877 called for the payment to the Treasury of 10% of receipt from all timber cut in public forests for restocking and improving these forests. For over a century this law contributed considerably to the conservation and improvement of over 6 million ha. of municipal and communal forest stands. In Italy, it was with much the same idea of achieving financial independence that its government agency for public domain forests (the Azienda di Stato per le Foreste Demaniali) was established by the Law of 2 June 1910 during the initial phase of the creation of Italy's public sector. In Spain, the financing of the Patrimonio Forestal del Estado (State Forest Fund) in 1941 and of the United Kingdom's Forestry Commission represents variants of the precedent set by Italy.

In Latin America, one of the special means of financing most commonly used is the National Forest Fund. Other means of great interest are those used by semi-autonomous forest authorities and public forest enterprises. Finally, systems offering economic incentives for forestry development, based primarily on tax exemption, have had a spectacular impact in certain countries.

3.2.1 National forest funds

A national forest fund can be defined as a special account of the national treasury, set up for separate financing of activities with well defined purposes of forestry development. In France, the Fonds forestier national was established by the Law of 30 September 1946; this fund, which is fed by a tax on sawmill and lumbering products, has made possible the reforestation of over a million and a half hectares and has served as a model for various national forest funds in Latin America. In recent years too, several countries of Africa (Cameroon, Congo, Ivory Coast, Ghana, Gabon and the Central African Republic) set up their own national forest funds using special forest taxes for the financing of long-term forest management and reforestation programmes and projects. Thailand and the Philippines have similar funds.

In Latin America, according to our information, Argentina, Bolivia, Costa Rica, Ecuador, Guatemala, Haiti, Mexico, Panama, Paraguay and Uruguay now have their own national forest funds. The main features of these funds are shown in FIGURE 40. The main sources of income for these funds are: (a) either a one-time lump sum allocation or regular appropriations out of the general government budgets; (b) taxes, duties, fees and money penalties derived from forests; and (c) receipts from sales of forest assets and products.

Bolivia's recent forest law contains provisions relating to a forest fund (see FIGURE 41), illustrative of the usual manner in which such funds were started, funded and administered, how accountancy and comptroller checks are conducted and how funds are used in Latin America.

As economic planning became more widespread and perfected, doubts have arisen as to the value of a financing formula such as the national forest funds, based largely on automatic reinvestment of part of the returns from forests. These funds have also been criticized because they might not strictly comply with the principle of having a single national budget, which is prescribed by the constitutions of many countries. As regards this last point, note that national forest funds, by law, come under the central comptrollers' offices and must comply with general rules and regulations pertaining to the collection, custody and disbursement of public funds.

FIGURE 40
NATIONAL FOREST FUNDS IN LATIN AMERICA

COUNTRY	Instruments for creation of the fund	Source of Funds		Administration of the fund	Use of Resources			Manner of controlling the fund
		National budget	Taxes, fees, sanctions, sales of products, etc.		For purposes set out in the Forest Law	Mainly for reforestation work	For purposes specified in the Law	
ARGENTINA	Law on Protection of Forest Resources (Arts. 47-56) 25 Sept. 1948	yes	yes	The Forest Authority	-	yes	yes	
BOLIVIA	General Forest Law (Arts. 79-85) 13 August 1974	yes	yes	Forestry Development Centre		yes	yes	Comptroller-General
COSTA RICA	Forest Law (Arts. 32-38 and 51) 25 Nov. 1969	no	yes		yes			
ECUADOR	Law No. 07 (Arts. 24, 25, 26) 24 January 1958	no	yes	Forestry Development Department	yes	-	-	Comptroller-General of the Nation
GUATEMALA	Forest Law (Art. 70) 21 June 1974	no	yes	National Forestry Institute	yes			
HAITI	Law of 5 July 1966 and Decrees of 20 November 1972	no	yes		-	yes		

.../...

(Fig. 40, continued)

COUNTRY	Instruments for creation of the fund	Source of Funds		Administration of the fund	Use of Resources			Manner of controlling the fund
		National budget	Taxes, fees, sanctions, sales of products, etc.		For pur- poses set out in the Forest Law	Mainly for refores- tation work	For pur- poses specified in the Law	
MEXICO	Forest Law (Arts. 58-59) 29 Sept. 1965	yes	yes		yes			
PANAMA	Forest Law (Arts. 58-59) 29 Sept. 1966	yes	yes		yes			
PARAGUAY	Forest Law (Arts. 48-51) 16 Nov. 1971	yes	yes	National Forest Service	yes	-	-	Ministry of Agriculture Comptroller- General
URUGUAY	Law No. 13723 (Arts. 54-57) 16 Dec. 1968	yes	yes		-			

FIGURE 41

BOLIVIA - FOREST FUND

FOREST LAW

13 August 1974

CHAPTER XV
ON THE FOREST FUND OF THE NATION

Article 79 - In order for the Centro de Desarrollo Forestal (Forestry Development Centre) to be able to perform efficiently the functions and duties ascribed to it by this Law, a Forest Fund of the Nation is hereby established.

Article 80 - The Forest Fund of the Nation shall have the following sources of income:

- (a) Annual allocations out of the General Budget of the Nation;
- (b) 75% of any forest fees set by the Ministerio de Asuntos Campesinos y Agropecuarios (Ministry of Campesino Affairs and Agriculture) and the Ministerio de Finanzas, according to the requirements of the said centre during the first two years, after which this income shall be used directly by the said centre. The remaining 25% will go into the Tesoro General de la Nación (General Treasury of the Nation) for annual budgeting for the sector;
- (c) Proceeds from lumbering by the said centre;
- (d) Proceeds from sale of plants grown in forestry nurseries and from seed of forest tree species;
- (e) Income from sanctions levied for infractions of this law;
- (f) Hunting and fishing fees;
- (g) Fees paid for utilization of natural forest produce;
- (h) Contributions and donations by private or public persons or agencies, whether national, foreign or international;
- (i) Payment of pending debts plus legal interest payable as forest fees or for other forest activities;
- (j) Proceeds from sale of forestry property.

Article 81 - Funds collected as above shall be deposited in a special account of the General Treasury of the Nation in the Central Bank of Bolivia.

Article 82 - The Forest Fund of the Nation shall be managed and administered independently by the Forestry Development Centre, with supervision by the Contraloría General de la República (Comptroller-General of the Republic).

Article 83 - The Dirección General de la Renta (Internal Revenue Department), through its regional offices, shall be responsible for the above-mentioned collection of funds.

Article 84 - The Forest Fund of the Nation shall be used for the full or partial financing of:

- (a) Forest inventorying and research projects and programmes pertinent to all aspects of development of this sector;

.../...

(Fig. 41, continued)

- (b) Projects and programmes for restoration and management of timber resources in both production stands and protection reserves;
- (c) Stand treatment or plantation works assigned priority in classified watersheds and protection districts;
- (d) Infrastructure-building - whether roads or other similar works - having a direct impact on the development of the country's forests;
- (e) Projects or programmes and scholarships for training or specialization of technical staff of the Forestry Development Centre;
- (f) Participation of technicians of the said sector at congresses and meetings, whether regional or international, directly relating to forestry or forest sciences;
- (g) Payment of salaries and wages to manpower of the Forestry Development Centre.

Article 85 - The Forestry Development Centre shall submit its annual projects and budgets for operational expenses and investment as well as for wages and salaries, for approval by the Ministerio de Asuntos Campesinos y Agropecuarios and the Ministerio de Finanzas.

This National Forest Fund is organized to meet the requirements of a PFA which, it should be remembered, must secure supplies of raw materials for industry, conduct long-term activities and counteract the trend in a market economy towards drainage of capital out of the forestry sector. This explains the great achievements due to national forest funds in various parts of the world and the fact that many countries have recently created their own national forest funds, while still others, notably the Dominican Republic and Surinam, are planning to do so. Furthermore, as national forest funds can be administered with relative ease, they can also be adapted to meet the needs of greatly diverse economies. For instance, Argentina's National Forest Fund has recently been strengthened and, coupled with other incentives, has proved an important factor in promoting forest plantations. In Uruguay, the assets of the National Forest Fund go into annual investment plans that are part of a nationwide programme to promote afforestation. Although in certain countries, notably Mexico, the national forest funds contribute comparatively little to the investments of the PFA (19 million pesos out of a total of 192 million in 1974), in other countries, Costa Rica in particular, the assets derived from the national forest funds are greater than those allocated for the PFA in the regular government budget.

In short, it should be noted that the administration of certain national forest funds must be made more efficient and expeditious, especially in fund disbursement, since funds must be made available only for systematic forestry development purposes jointly with other resources of the PFA's. Other such funds need to be revitalized by increasing their incomes. This can be achieved in part by making it clear that income of the PFA from the sale of timber from public land is not merely a tax or duty, as is alleged in certain countries, but is the sum of two components, namely: returns on forest capital plus retribution to the PFA for its management work.

3.2.2 Public enterprises

Out of eight autonomous or semi-autonomous PFA's in Latin America (see FIGURE 10), five are called institutes ("institutos"), one a centre ("centro") and two, public enterprises ("corporaciones"). The financing of Chile's Corporación Nacional Forestal - CONAF (1973), and of Honduras' Corporación Hondureña de Desarrollo Forestal - COHDEFOR (1974) are of great interest because of their innovative character, although in view of the recent establishment of both of them it would probably be premature to try to draw firm conclusions regarding the advantages or drawbacks of this method of financing.

The initial assets of these forest authorities consist of either government appropriations (as is the case with COHDEFOR) or else appropriations from each of four active partners

in the enterprise (the case of CONAF), one of which contributes more than the others (the Corporación de Fomento de la Producción). Such initial assets subsequently grow by the addition of some of the earnings of the authority which the executive branch assigns to it through the board, as in the case of COHDEFOR, or else out of the "natural or civil returns on the assets of the enterprise, including fees agreed upon with third parties for lumbering rights or use concessions" (CONAF). Furthermore, the resources of these bodies can also be increased by regular or extraordinary allocations of the active partners (CONAF) or by assets of goods transferred to it by the government (COHDEFOR), by payments for work, legacies, donations, subsidies, loans, etc. Both these enterprises were established with the idea not only that they would produce goods and services, but also that they would be self-financing and, at least in the case of COHDEFOR, earn net profits which, save for that portion that went to increase their resources, would go into the public treasury. CONAF, whose 1974 budget calls for a 75.8% increase, aspires to self-financing starting in 1975. 1974 budgetary estimates of COHDEFOR already envisage a gross income of 141 million lempiras (equivalent to US\$ 70.5 million) and net profits of 25.4 million lempiras. As can be seen, the financial aims of both of these authorities are similar, although COHDEFOR's mandate is particularly ambitious and its functions very broad, since it is responsible for the utilization of the forests of the entire country on condition that it pay a fixed fee for the working of private stands.

3.2.3 Fiscal benefits

L.M. Bombín^{1/} recently studied the many economic incentives now offered in Latin America to promote forestry development. It seems advisable at this point to underscore the notable impact of several kinds of fiscal benefit systems which are operated by PFA's at least in part, i.e. the fiscal benefits granted to capital investors in forestry development and particularly in afforestation and reforestation work. In the case of Brazil, which has promulgated laws and detailed rules and regulations in this connection, this is of great interest.

According to recent data^{2/}, some 1,700,000 hectares were reforested in Brazil thanks to the system of fiscal incentives for capital investment, having generated investment of close to US\$ 500 million through a total of 8,815 reforestation projects approved over 9 years (see FIGURE 42).

FIGURE 42

BRAZIL - REFORESTATION IMPLEMENTING LAWS ON FISCAL INCENTIVES FOR CAPITAL INVESTMENT

Legal Instrument	Investments (equivalent in US dollars)	Area reforested (in ha.)	Period
Law No. 5106 of 2 September 1966	289,687,202	1,200,611	up to 31 December 1974
Decree-Law No. 1134 of 16 November 1970	206,575,563	504,950	up to 8 May 1975
TOTALS	496,262,765	1,705,567	-

^{1/} L.M. Bombín - "Incentivos Económicos Forestales en América Latina", a paper for the Seminar on Modernization of Public Administration in the Forestry Sector of Latin America, Lima, Peru, 1975.

^{2/} H. Oliveira - Data submitted to the FAO/SIDA Seminar on Forestry Development Planning (Quito, 30 June - 8 August 1975).

The possibility of excluding from taxable income whatever capital is used for afforestation, in other words, the fiscal incentives for capital investment - a dynamic factor rather than benefits to landed proprietors (usually passive) - has given rise to the organization of hundreds of enterprises specializing in afforestation work and in the submission of thousands of afforestation projects to the IBDF, the agency responsible for approving such projects. Recently (Decree 465 of 8 February 1974) Argentina, a country with great experience in the use of credit for forestry development, has introduced a system of deduction of investment in afforestation from income taxes. In this case too, the PFA - IPONA - handles one key to such fiscal incentives, because it is responsible for approving the respective afforestation plans.

3.3 Physical Assets and Equipment

From certain replies to the National Questionnaire rather detailed information can be gathered on this point, whereas others merely give indications of a general character. In any case, some of the information received confirms the multiplicity and geographic dispersal of the tasks of the PFA's. In several countries, the PFA's have considerable material means: Colombia's PFA, for instance, values the plant and equipment at its disposal at 120 million pesos (equivalent to US\$ 4,138,000). As a rule, one gathers the impression that only a few PFA's in Latin America have material means commensurate to their staffs or, in other words, adequate funds for their staff to be able to perform their duties normally and efficiently.

It appears obvious from the replies that the main aim of the central PFA's consists in maintaining their staff well deployed over the country (with housing or living accommodation, shelters, etc.); in making sure that their staff have the necessary mobility (roads and all kinds of vehicles, including boats, aeroplanes and helicopters); and in maintaining a good system of observation, and especially of communications (radios, radio-telephones, etc.). This function of "being present" out in the field must be developed further, since it is indispensable for the accomplishment of the main tasks of the PFA's. In addition they have other assets - equipment and basic facilities - for inventorying, map-making, conducting research, producing nursery plants, road building and construction of civil engineering works, lumbering, transport, sawing, preservation and processing of timber, fire-fighting, and so forth.

As for real estate and holdings, the PFA's either own outright or have usufruct of buildings for offices, laboratories, warehouses, housing, schools, etc. Argentina's PFA, for instance, has 21 forest stations throughout the country, normally consisting of houses or living accommodation, offices, warehouses, electric power plant, nurseries, experimentation plots, workshops, water supply, and other equipment.

As for vehicles, the PFA of Mexico has over 800, that of Chile 106, Ecuador's 60, El Salvador's 34, Guyana's 24 boats - just to mention a few significant figures.

As for equipment, several PFA's have complete sawmills (either fixed or mobile) with timber impregnation plants, carpentry workshops, etc. The frequent mention of tractors and land-moving equipment indicates that many PFA's also cultivate nurseries and build roads. Very often, mention is also made of equipment necessary for timber felling and clearing (Chile, for instance, mentions its 245 motor saws), heavy transport vehicles, and cultivation and planting machinery. Among the technical and scientific instruments mentioned, note is made of the computers for the use of the PFA (Mexico), research equipment of all types (Argentina), and topography and cartography instruments used by almost all PFA's.

If one compares the figures on capital assets and equipment of PFA's with their staffing, it appears that in many cases the ratio of these two factors has improved. It would be absurd for PFA's to have assets and equipment that they cannot use for lack of staff. But this does not mean that all PFA's have material means and staff proportional to the tremendous scope of their functions. A glance at FIGURE 39, showing forest land which PFA's must administer, protect or care for, as the case may be, suffices to confirm this. What can be said, though, is that during the past few years there has been

progress in many countries in the region in providing their PFA's with adequate material means to prevent their staff from being immobilized for lack of vehicles or being ill-informed regarding the real circumstances in the forests for lack of map information and observation means.

CHAPTER VI

INFORMATION, RESEARCH, PUBLIC RELATIONS

1. GENERAL PROBLEMS

Like any other human activity, administrative work involves decision-making. To make rational decisions^{1/} means choosing between several courses of action through which a specific goal can be reached within a certain period of time. For the making of such choices one must rely on knowledge of facts, cause-and-effect relationships, consequences and trends. All this information can be obtained because of the human aptitude to perceive, make systematic observations, learn skills, gain experience and anticipate the future.

Normally the quality of a process and of its component steps depend on the quality of decisions made. This quality, in turn, depends on the nature of the information available. Given such a correlation it is understandable that the key to improvement of the performance of PFA's is better information.

Every PFA requires information as complete, valid and reliable as possible on: forestry techniques; relations between soil types, tree species and their increment; wooded areas, their quality, standing volume and technological properties of timber; ownership and size of forest estates; consequences of silvicultural treatment, etc. To secure a smooth administrative functioning of the PFA's, information is also required on human relations, on the consequences of various types of management and various forms of organization, on work methods and control, etc. These examples show the scope of the information problem within the PFA's. In addition there are problems related to information about other institutions and the public, including knowledge of demand for products and services derived from the forests, and about communication methods and means.

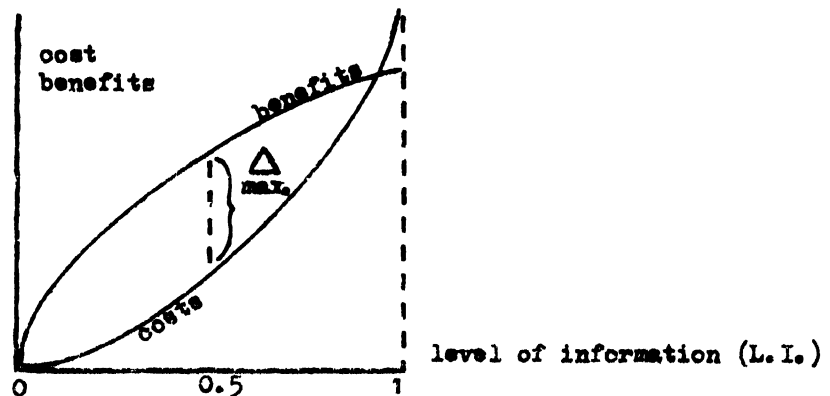
Well founded decisions require in theory a certain amount of information. For lack of time and reasons of cost it happens only rarely that all the necessary information can be assembled. In other words, the information available is normally less than what is really required. The ratio of available information to necessary information is called "level of information" (L.I.).

$$L.I. = \frac{\text{available information}}{\text{necessary information}}$$

The level of information may range from 0 (absolute ignorance) to 1 (full information). In making economic, administrative or other decisions, it is not possible to reach the L.I. 1, not only because of the time factor, but also because one cannot expect to base decisions exclusively on cause-and-effect relationships. It would also be uneconomical to achieve the L.I. 1, given the increase in the cost/benefit ratio when the level of information approaches 1 (see diagram).

The diagram indicates that obtaining all the necessary information entails an exponential rise in cost, whereas the corresponding benefits tend to decrease. The most economical level of information will be determined by the maximum difference (Δ) between benefits and cost (in the diagram maximum Δ corresponds to a L.I. 0.5).

^{1/} Irrational or spontaneous decisions will not be discussed here.



The L.I. refers only to the amount of information. Nothing is said regarding the quality of such information, which can be defined in terms of "accuracy" (precision) and "reliability" (improbability of error). Information is derived thanks to three human faculties: the ability to observe (facts and processes); the ability to learn by analyzing the cause-and-effect relationship; and finally, the ability to foresee or anticipate. By using these faculties one obtains measurements, verbal descriptions, tested experience, explanatory models and models for decision-making. The main sources of information for the PFA's are: research, resource inventories, statistics, analytical findings from technical, economic and accountancy control, publications and ad hoc trials (special experiments)

2. RESEARCH

2.1 Current Prog

Almost all Latin American countries already have their forestry research programmes or are considering the launching of such programmes. FIGURE 43, which is based on the replies to the National Questionnaire, shows which problems are already being, or will shortly be, investigated and the percentage of countries having research programmes for each set of problems. FIGURE 44 shows that the number of forestry research bodies that are regular constitutional members of the International Union of Forestry Research Organizations (IUFRO) doubled in Latin America in the past ten years.

With regard to the sets of problems mentioned in FIGURE 43, research on increment of tree species is generally concentrated on fast-growing exotic species (especially the various species of Pinus), so that valid data obtained can be rapidly applied. Most trials are conducted by using correct methods (with enough repetitions to eliminate statistical errors). Less research is being done on native species, although research on the increment of these species in correlation with site classes and silvicultural treatment is needed.

Technological research refers to wood properties for various forms of timber uses (density, elasticity, vulnerability to fungus and insect infestation, impregnation, etc.). For reasons of cost only a few countries (Brasil, Chile, Mexico and Venezuela) have well equipped laboratories for full-scale timber technology research. That is why PFA's of some countries cooperate in this field with universities (e.g. Costa Rica) or with institutes of the wood-using industry. Certain PFA's limit their technological research to processing (impregnation, drying, sawing, etc.). When research requires considerable investment, it is advisable to examine several possible solutions such as contracting the services of university or industrial institutes or laboratories and cooperating with industry, machine manufacturers, or producers of chemicals for the treatment of timber. Costly research may also be conducted jointly with outside laboratories.

FIGURE 43

ONGOING OR PLANNED FORESTRY RESEARCH PROGRAMMES

No.	Sets of Problems	% of countries investigating them
1	Increment of tree species, including genetic and provenance trials	77
2	Wood technology	77
3	Silvicultural treatment, including ecological trials	62
4	Forest inventories	54
5	Soils (types, classification, fertilization)	46
6	Forest pests and diseases	16
7	Economic trials	16

FIGURE 44

LATIN AMERICA: IUFRO MEMBERSHIP

in 1965

Argentina

Dirección de Investigaciones forestales
(Forestry Research Department)
Buenos Aires

Brasil

Escola Nacional de Florestas
(National School of Forestry)
Universidade de Paraná
Curitiba, Paraná

Costa Rica

Instituto Interamericano de Ciencias
Agrícolas
(Interamerican Institute of Agricultural
Sciences)
Turrialba

Mexico

Instituto Nacional de Investigaciones
Forestales
(National Forestry Research Institute)
Coyoacan, D.F.

Venezuela

Facultad de Ciencias Forestales
(School of Forestry Sciences)
Universidad de los Andes
Mérida

Instituto Forestal Latino-Americano de
Investigación y Capacitación
(Latin American Forestry Research and
Training Institute)
Mérida

.../.

(Fig. 44, continued)

in 1975

Argentina

Instituto Forestal Nacional
Buenos Aires
Centro de Investigación y Recursos
Naturales
(Natural Resources & Research Centre)
Instituto de Botánica Agrícola
Buenos Aires

Brasil

Faculdade de Florestas
(School of Forestry)
Universidade Federal do Paraná
Curitiba, Paraná

Chile

Facultad de Ingeniería Forestal
(School of Forestry)
Universidad Austral de Chile
Valdivia
Instituto Forestal
Santiago

Colombia

Instituto de Investigaciones y
Proyectos Forestales y Madereros
(Forestry and Timber Projects
and Research Institute)
Universidad Distrital
Bogotá

INDERENA

Bogotá

Costa Rica

Instituto Interamericano de Ciencias
Agrícolas
Turrialba

Cuba

Centro de Investigación y Capacitación
Forestales
(Forestry Research and Training Centre)
Havana

Mexico

Instituto Nacional de Investigaciones
Forestales
Coyoacan, D.F.

Paraguay

Instituto Nacional de Tecnología y
Normalización
(National Institute of Technology and
Standardization)
Asunción

Trinidad y Tobago

The Forest Department
National Forest Research Institute
Port-of-Spain

Venezuela

Facultad de Ciencias Forestales
Universidad de Los Andes
Mérida

Instituto Forestal Latino-Americano de
Investigación y Capacitación
Mérida

Asociación Nacional de Forestadores de
Arboles Maderables
(National Association of Timber Tree
Foresters)
Salom, Estado Yaracuy

Source: IUFRO: Annual Report, 1965; excerpted from IUFRO News No.10, March 1975.

Silvicultural treatment, including ecological trials, often takes third place. As a rule research is done on clearing, thinning, reforestation (techniques, spacing, etc.), production of certified seed (seed banks) and nursery plants, natural regeneration methods, etc. Such research can rapidly give valid results, and significantly increase yields and improve quality without incurring high costs. Moreover, in view of the low cost of such trials they can be systematically intensified.

Methodological forest inventorying constitutes one form of research. The standard methods of stand inventorying (covering types of stands, species, volume, tree diameters, etc.) are well known and already well developed. A special methodology can be devised by adjusting the standard methods to national, regional and local circumstances. Once the special methodology has been worked out, the question arises as to whether inventorying is to be considered as research, statistics or in a special category per se.^{1/}

Soil research is included in the programme of about half of the countries. By classifying forest soils according to a clear typology it is possible to select appropriate tree species for each type of soil and consequently enhance increment, improve quality, as well as prevent pests. Certain countries (Chile, Peru) are preparing maps showing forest soil types.

Research on forest pests and diseases is being done by only 16% of the countries. Logically, PFA's ought not to be expected to do basic research, but it is necessary that each of them has within its own research set-up a plant health and entomology service that deals with pest and disease prevention by making regular inspections and that advises on controlling forest pests and diseases.

Little research is being done on forestry economics (only 16% of the countries or 30% of them if one includes technical trials that can provide data for research in forestry economics). It seems very necessary for this branch of research to be strengthened. Provided economists are available, it would be relatively easy to conduct forestry economics research, as no great outlay of financial resources is involved. Moreover, the application of the results gives very rapid returns, so that there is normally a very high benefit/cost ratio.

In the replies to the National Questionnaire no mention is made of research on work techniques (organization models for technical processes, suitable implements and instruments, ergonomics, time/output studies), nor is there any mention of research on administrative processes^{2/} or information systems and public relations^{3/}, to research on wildlife, recreation and the environment^{3/}.

2.2 Systems and Assignment of Responsibilities

Many countries have special research departments in their central offices (Dirección General, etc.); for instance Bolivia (planned), Costa Rica, El Salvador, Guyana (unit of the Silviculture Department), and Paraguay^{4/}. These units of the central offices draft programmes of work and control their execution jointly with research workers. As a rule it is on the basis of medium-term programmes that annual programmes are drawn up, as the former set the objectives, define methodology and suggest trial sites. Normally the PFA's have permanent experiment centres (i.e. Argentina, Brazil and Paraguay).

- 1/ In this study the last alternative is used, since forest inventories are an essential source of information for PFA's in any case.
- 2/ Countries with O+M units (Colombia, Ecuador, Mexico, Peru) have dealt with some of these aspects.
- 3/ Aside from research on watersheds (Ecuador) and some aspects of wildlife (as in Argentina, Venezuela).
- 4/ Sometimes each department (protection, utilization, etc.) is in charge of research in its own field (Surinam).

A variant of this type of full integration is found in countries that have their own research centres as intermediary agencies between the central offices of the PFA and the experiment stations (i.e. Cuba, Ecuador and Nicaragua). Sometimes these centres are also in charge of training work.

Some countries have set up forestry institutes, for instance Argentina (the INIA), Chile and Mexico^{1/}. These institutes come under the central offices of the PFA's, although they enjoy a greater degree of independence in their programming. Chile's INFOR comes under two ministries, that of agriculture and that of economy, thus providing liaison between the PFA and the forestry industry, which are both represented on INFOR's Board of Directors.

Colombia has started using a new means for the development of forestry research. It launched a national forestry research programme (1972-1982). Since then the Government and private enterprises in the national forestry sector have established the Corporación Nacional de Investigación y Fomento Forestal (CONIF) (National Research and Forestry Development Authority) with a threefold purpose: to give decisive impetus to forestry research; to promote reforestation; and to foster socio-economic development in parts of the country where forests are being lumbered. INDERENA's share capital in CONIF amounts to 50% and therefore it has considerable voice in the selection of problems on which research is to be conducted.

In Brazil, a semi-autonomous federal agency, the "Empresa Brasileira de Pesquisa Agropecuária" (EMBRAPA) was empowered, by Decree No. 75376 of 14 February 1975, to take up the responsibilities for research in forestry and forest products previously assigned to the IBDF.

Another alternative is cooperation between PFA's and university or other scientific institutions. PFA's define the problems and set the main goals, whereas the university or private research institutes are responsible for methodology and execution of these programmes on a contract basis (as in Costa Rica, and in Peru up to 1974). Whether or not good results are achieved thereby depends on the availability of research workers and the amount of interest shown by the institutes in the research requested. A very similar arrangement is used by the research centres at certain universities in Brazil. These centres obtain contracts with the PFA and then entrust the research to teams of research workers.

In all the solutions described above, save the contracts for cooperation, it is difficult to evaluate the exact influence of the PFA's on the choice of problems on which research will be conducted and consequently on the priorities and allocation of funds to the various programmes. The programming of applied research is the key to progress in the forestry sector. In principle it is very clear that the ultimate decision as to programmes and priorities is the exclusive responsibility of the heads of the PFA's. If this is not the line followed, the programmes will as a rule largely depend on the specialties and personal inclinations of research workers. This does not mean that research on important problems is necessarily relegated to second place, but there is no assurance that due attention will be paid to them from the outset. It seems advisable for the executives and field staff (regional heads, chiefs of districts, nursery operators, industry managers, etc.) to have a certain amount of influence in the programming of research. It is therefore recommended that research councils be set up in the PFA's as advisory bodies to the directors or chiefs of research departments.

2.3 Prerequisites

Researchers need special preparation in forestry research, for instance in methodology and planning of experiments, statistical analysis, application of operational research techniques, etc. It is highly recommended that young researchers work for some time under

1/ Mexico's National Institute for Forestry Research is not responsible for inventorying, which task falls to the National Inventory Office.

the direction of an experienced researcher, and in many instances it would be advisable that they be assigned to teams of certain large institutes.

For applied research, access to good libraries is needed (for books, specialized periodicals and other publications) that have current card indexes of international research and documentation centres (for instance the ones in Oxford, Reinbek and the IFLAIC).

Permanent experiment stations play an essential role as they facilitate regular observations, immediate corrections and efficient control. It is recommended that some research workers become acquainted with the area in the vicinity of such stations so as to save time by concentrating on a series of trials there. Due to daily contacts among researchers this solution generates a better atmosphere for research work. It is best to disperse the stations over the main ecological regions, although such decentralization will not be feasible for all lines of research. As regards timber technology and photo-interpretation laboratories it is preferable that they be located at a central point.

3. RESOURCE INVENTORYING AND STATISTICS

Any type of planning (forest policy; national, sectoral and regional plans; stand management plans) must absolutely be based on resource inventories and statistics. Regular compilation of statistics and inventorying is also essential for the analysis of forest development trends, for forest management, for control over execution of work, and to lay the grounds for organizing the supply of raw material to sawmills and other forest industries.

A complete set of inventories and statistics would include:

(a) Forest inventories

- areas
 - forested
 - productive
 - non-productive
 - protection
 - not forested but suitable for forestry
- soils (and climatic data)
- forest stands

(b) Socio-economic statistics

- forest industries
- employment situation
- influence of other sectors

The area inventory can be made from general maps, land surveys and aerial photographs. In the starting phase, detailed photographic mosaics are used as an initial approximation to reality. It is very important that non-forested land suitable for forest-growing be delimited (as in Chile, Colombia and Mexico), as well as woodlands that can be converted to non-forestry use (Surinam). It is also interesting to make an area breakdown by geographic/administrative units (states, provinces, regions, municipalities, etc.) as well as by land holdings and size. Normally accurate geographical data are available on such areas, although the breakdown by land holdings and size is usually based on estimates. Most countries are improving their inventories in this respect.

The selection of tree species and the type of management most appropriate for the ecological situation, as well as the determination and delimitation of soils suitable for forestry are all based on soil inventories (Argentina, Brazil, Chile, Guatemala, Jamaica and Peru). Climatic data are very useful for judging ecological conditions and as a guide for

management. They may be obtained from existing maps and be complemented with observations made at the PFA's own meteorological stations.

Forest stand inventories can provide various types of information, namely: type of stand (natural or man-made, hardwoods or softwoods, various mixtures of species, etc.); volume of standing timber (total, accessible); timber mass distribution according to diameter quality, extraction conditions, etc. Primarily for reasons of cost, only a few countries are systematically inventorying their forest stands (Chile, Colombia, Mexico, Peru), although almost all of them have done partial inventorying (Brazil, Honduras, Venezuela). In large-scale inventories, a distinction is usually made by types of stand, representative samplings being taken (from aerial photographs and through land cruising) in order to determine volumes, diameter classes, and sometimes even quality and lumbering conditions.

Thus far there are only a few countries that have statistics on forest industries based on industrial censuses and showing the volume of processed timber. Normally only global figures are given with no indication of geographic distribution or industrial capacity. It would be advisable to obtain better statistics on forest industries, preferably by including them in the national and regional censuses which are regularly repeated. It would be desirable to have data according to administrative districts or regions with respect to various branches of the industry (from sawmills to pulp and paper plants), and on specific commodities, annual production, capacity of industries and supplies of raw materials. Such data would make it possible to organize and plan for the timber market - balancing supply and demand - and to provide guidelines for reforestation programmes, regional development planning, etc., pointing up priorities and trends.

The employment situation can be gauged in broad outline from regional and national censuses, which knowledge serves to indicate the availability of manpower as well as what manpower the forestry programmes can absorb in order to diminish unemployment. General information from censuses should be supplemented by the PFA's with specific surveys and studies on topics such as the impact of forest industries and road infrastructure, upon internal migration (Brazil, Colombia, Panama), on employment opportunities in agro-forestry settlements, etc. (Honduras, Mexico, Peru).

The influences of other sectors include the socio-economic impact of the forestry sector upon urbanization, population density, public works, recreation and tourism, watersheds, etc. and especially upon agriculture (crop and animal production). In planning forestry work the actual impact as well as trends should be considered. Also in this case, some of the pertinent data can be derived in part from available statistics, although additional studies and specific surveys carried out by the PFA's will be required to supplement them.

Changes in forestry development, land use, industrial and socio-economic trends as well as advances in science and technology make it necessary for inventories and statistical surveys to be repeated. Soil inventories are valid for the longest time and it suffices to repeat them in cycles of 20-30 years. As far as other inventories and statistical surveys are concerned, the following (approximate) repetition periods should be adhered to: on forest areas every 10-20 years, on forest stands every 10 years, on forest industries from 1 to 5 years, on the employment situation from 1 to 3 years and on the impact of other sectors from 2 to 5 years.

In some countries special divisions of the central offices of the PFA's are solely responsible for the preparation and evaluation of statistics and inventories (as in Guyana and Mexico). In many other countries this work is spread out among various lower-level units (for instance, in Ecuador it is the Photointerpretation Section; in Guatemala and Paraguay the Forest Inventorying Sections). Chile's Forestry Institute has taken upon itself both research and inventorying. A special solution is that of Peru's Oficina Nacional de Evaluación de Recursos Naturales (ONERN) (see Section 2.4 in Chapter V). Colombia's CONIF, in cooperation with private enterprise, is inventorying 300,000 ha. of forests, compiling maps showing types of stands in lumbering zones, and is doing research on land suitable for economical afforestation.

For the future development of forest industries and forestry statistics it seems advisable to have catalogues compiled for all the subjects for which fresh data are permanently required. These are considered sine qua non for laying down forest policy with full knowledge of facts and figures as well as for preparing national and regional development plans, establishing guidelines for forest management and planning, and organizing supplies for forest industries^{1/}. Once partial facts and figures and specific data have been compiled, they must be collated and assembled or logically grouped. Such data then become the basis for various plans, programmes and directives. Ways and means for such inventorying and compilation of statistics for each fiscal year need to be found, including the appropriate methodology, periodicity, cooperation with official institutions, staffing requirements and required materials and funds. Finally, priorities among the various types of inventories and statistics to be provided by the PFA's need to be set and the possibility of using available inventory and statistical data for forestry purposes investigated.

4. TECHNICAL AND ECONOMIC CONTROL BASED ON ACCOUNTANCY DATA

One very important source of information, thus far little developed if not entirely ignored, is technical and economic control based on accountancy data. Such control supplies valuable information for the improvement of forest management and techniques. This information is useful for the development of local activities (area, zone or district) along economically sound lines, and for the whole forestry sector (through extension work). Not only can production be increased in this way, but costs can be reduced and output bettered. Such information is generated by normal accountancy practice and through technical annotations made in the course of the annual cycle. The sole point of difference from normal accountancy is the special grouping of data according to the specific problems considered. For instance, one might consider: roundwood production; the production of nursery stock; the results of different silvicultural techniques; thinning; road construction and maintenance. Notes have to be taken on variants in technology and on technical data, economic data, time spent, etc. in connection with the particular problem being considered, and these must then be assembled according to conditions (soils, accessibility of stands, slope of terrain, etc.). In the next stage, results within each group will be compared (for instance, data relating to one and the same process for which different techniques are used) and the reasons for the discrepancies will be analyzed. Once the differences or discrepancies and their reasons or causes are known, the techniques and the organization of processes can be improved. If this internal comparison is repeated year after year (eliminating differences attributable to trends in prices, wages, etc.), it is possible to achieve permanent progress from the technical/economic standpoint through what can be termed "experimental management"^{2/}.

Another possible way to stimulate progress is through "external comparisons", that is, comparison of results between several areas or districts. For such external comparisons, prior grouping of districts or areas into homogeneous types is essential in order to identify those whose principal natural features (topography, climate, vegetation, etc.) are practically the same. The comparison of the same sets of data for similar districts or areas opens opportunities for collaboration among staff and stimulates professional emulation.

It is not difficult to devise a concrete system for the grouping of already available data. It suffices to utilize data that describe logically the problem being investigated. Such collation of data can be done, as was said, by ordinary accountancy, but in the long run it is best to devise a standard information system for all districts (as well as decide on a computer programme), thus laying the groundwork for a management information system (MIS).

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- 1/ Most information, facts and figures deemed necessary on a permanent basis have already been listed in Section 3.
 - 2/ A classic example of this procedure is the "Swiss Control Method" by means of which applicable silvicultural techniques for natural and man-made stands can be improved. By applying this experimental management pattern, the district or area chief can devise simple trials which in most instances need no great theoretical knowledge, but rather accuracy and carefulness in taking measurements.

It is recommended that the results or data be condensed every year, using descriptive indices of results of production, stand management and other types of work in each area or district (FIGURE 45). Comparisons between districts, zones, regions, etc., and ultimately evaluation or assessment, are rendered easier by collating the findings by regions with comparable ecological and economic conditions. Such information, derived from economic and technical control based on accountancy data, is useful for an inexpensive and simple improvement of the forestry sector.

FIGURE 45

TABLE OF DESCRIPTIVE INDICES
(partial, schematic model)

Year: 19.. Region: Type of Area or District:

	Factors	Measurement Unit	Numbering of Districts or Areas			Average
			1	2	etc.	
	<u>Areas</u>					
1	Total					
2	Forested					
3	Of productive forest					
	<u>Production</u>					
4	Total roundwood					
5	Roundwood species "x"					
	<u>Distribution of Main Species</u>					
	<u>Species "x"</u>					
6	Class ...	%				
7	Class ...	%				
	⋮	⋮				
8	Total	100%				
	<u>Species "y", etc.</u>					
	<u>Nursery Plant Production</u>					
9	Species "x"	1,000 pl.				
10	Species "y"	1,000 pl.				
11	Total	2,000 pl.				
	<u>Reforested Area</u>					
12	Species "x"	ha.				
13	Species "y"	ha.				
14	Total	ha.				
15	<u>Silvicultural Care</u>	ha.				
16	<u>Thinning</u>	ha.				

(Fig. 45, continued)

	Factors	Measurement Unit	Numbering of Districts or Areas			Average
			1	2	etc.	
	<u>Staffing</u>					
17	Foresters					
18	Technicians					
19	Skilled workers					
20	Administrative staff					
21	Foremen					
22	Unskilled workers					
	<u>Manpower Employment</u>					
23	Total employment	hrs				
24	Average employment per man	hrs/year				
25	Average employment per area unit	hrs/ha.				
26	Timber production	hrs/m ³				
27	Nurseries	hrs/ha.				
28	Reforestation	hrs/ha.				
29	Road construction	hrs/100 m.				
30	Road maintenance	hrs/100 m.				
	<u>Use of Machinery</u>					
31	By type of machinery	hrs/year				
32	By type of task	hrs/unit of task				
	<u>Cost/Output</u>					
	Average price obtained					
33	- timber	.. / m ³				
34	- plants	.. / 1,000 pl.				
35	- etc.					
	Cost of					
36	- timber extraction	.. / m ³				
37	- reforestation	.. / ha.				
38	- road construction	.. / m.				
39	- road maintenance	.. / m.				
40	- production of nursery plants	.. / 1,000 pl.				
41	- manpower	.. / h.				
42	- productive manpower	.. / ha.				
43	- machinery	.. / h.				
	<u>Cash Returns</u>					
44	Quotient cost/returns	.. / ha.				
45	Quotient cost/returns	.. / m ³				
	<u>Increase in Productivity</u>					
46	Timber production	%				
47	Plant production	%				
48	Thinnings	%				
49	Total	%				

5. PUBLICATIONS

As instruments of information, PFA publications can be for either external or internal use. The former are intended for persons or groups not directly connected with the PFA nor even with the forestry sector (for instance, researchers in specialties other than forestry, economists, planners, industrialists, etc.). As will be seen, these also include publications pertaining to public relations (see next section). The second type of publication is intended for staff of the PFA and persons in the forestry sector (forest owners, officials, etc.), the main purpose of which is to inform professionals and add to theoretical knowledge and practical know-how pertinent to their activities and functions. Consequently the contents, manner of presentation, language, scope and other features need to be adapted to the interests, aims and level of instruction of professional staff. The well-known types of publications: books, periodicals (reviews, bulletins), pamphlets, circulars, notes, etc., have a variety of purposes. Books on forestry, written by recognized authorities on the subject, are essential for any central service of a PFA. There are many well-known texts in each specialty of forestry and related fields, although not so many in Spanish or Portuguese, and very few on conditions in Latin America. In any case it seems necessary for any central service to have a collection of such books both in the national tongue and in foreign languages (for instance Guyana's PFA has a librarian for this purpose). Also regional and local offices should have small libraries of books by recognized authorities on subjects pertinent to their work. To complete the list of Spanish books it is advisable that consideration be given to the translation of texts by specialised translation services, possibly with bilateral or multilateral financial aid. It is just as necessary that forestry research institutions have complete libraries of authoritative scientific books.

Many countries (Argentina, Brazil, Cuba, Chile, Mexico, Venezuela, for instance) publish forestry periodicals (reviews, bulletins). The main problem is that these national periodicals have relatively small press runs, with the consequent impact upon their cost. Still, such forestry periodicals are very valuable for publishing the latest research findings and providing other information useful in decision-making. Cooperation among countries with similar forestry conditions (as, for example, the Andean countries) could render it feasible to have larger press runs for forestry periodicals. It would be advisable, as an immediate measure, to intensify the exchange of forestry periodicals among countries and support the bulletin published by the IFLAIC.

Bulletins, circulars and notes can be published either regularly or occasionally. Such publications, of a strictly internal character, spread practical facts and figures, explain new techniques and describe regional or local experiments conducted. If written for field staff, they are very useful for improving day-to-day work. Their advantage is that they cost very little and can therefore be readily made available to all staff as required. Through such bulletins it is possible to disseminate concise information as well as abstracts of books and periodicals of most interest. It would be advisable that central service units be charged with the preparation of bulletins, circulars and notes. Such units could work hand in hand with extension services such as those already existing in several countries (Ecuador, Jamaica and Honduras).

These publication services could also take care of the said central libraries as well as of documentation work. By cooperating with the forestry documentation centres of world-wide renown the PFA's would be able to collect and catalogue all titles and bibliographic data found in national and international publications for their work at all levels/.

- 1/ In the international sphere, the best known documentation centres are the Commonwealth Forestry Bureau (Oxford, UK) and the Bundesforschungsanstalt für Forst- und Holzwirtschaft (Reinbek, FRG). On the regional level, the IFLAIC (Mérida, Venezuela) intends to expand its forestry documentation work with bilateral financial aid. Recently in FAO's AGRIS programme an AGRIS-Forestry System has been started for the coordination and strengthening of international work in forestry documentation, primarily for research purposes.

It is very important that efforts be made to produce good publications and check on their practical impact. The essentials for the first are clarity of presentation, objective and reliable information, as well as an explanation of the circumstances under which such information is applicable, simplicity of language and abstracts with the maximum informational content. In order to determine to what extent such publications become known and what application is made of new information and facts diffused in them, it is advisable to organize seminars, practical demonstrations and study tours for discussing practical experience.

6. PUBLIC RELATIONS

6.1 The Need for Public Relations Work

Public relations, in general terms, embrace all activities intended to create greater harmony and consistency between the interests of the forestry sector and those of the public. The main goal of public relations is to raise public consciousness regarding forests or, in other words, to give a clear and well founded idea of the renewable natural resources and their importance for human life and for the national economy, thereby inculcating in the public an understanding of the need for forestry development and for support of efforts intended to promote this development.

The public consists not only of individuals or private persons, but also of eminent people in high posts, opinion-makers and influential institutions. Sometimes the term "public relations" is confused with advertising or publicity. These, however, are directed towards an audience economically interested in the forestry sector, for instance merchants, industrialists, foresters, forest workers, etc., whereas public relations work is directed to the general public, with no immediate material benefits nor with the idea of gaining immediate financial profit. Advertisement pertains to products or services of commercial value, whereas public relations provide general information regarding the influences or interactions between natural resources and their benefits to mankind, hinging on their management on the one hand, and the general community on the other.

Public relations are necessary in forestry to increase knowledge regarding nature as a whole and biological relations within forests as a special type of vegetation; this is a contribution to education in general. Also, through public relations work, knowledge is spread regarding the relations between forests, wildlife, water, soil fertility, floods, climate, etc., thus stimulating the spirit of observation. By this means more information is accumulated and an understanding of factors important to mankind (water, climate, recreational amenities, food, protection, etc.) is gained.

Public relations work is also necessary in order to teach what contribution forestry resources make to the national economy, and to the supply of raw materials and timber products, as well as to food stocks, and how they protect other sectors, provide employment in rural regions and promote infrastructure-building.

Furthermore, through public relations work the significance of forestry work (afforestation, erosion control, watershed management, thinnings, fellings, haulage and transport, fire and pest control, etc.) is explained to the public, as are forestry techniques and forestry's contribution to public welfare and the national economy.

One important aspect of public relations is their aim to put across the obligations of forest owners (basic principles of forest law) and the obligations of correct behaviour of the public in relation to forests and all other renewable natural resources. The public should know the rules and regulations governing reforestation, deforestation, soil conservation, wildlife conservation, fire prevention, etc. This aspect of public relations work is mainly directed towards gaining objective, moral support of the broad public for forestry work.

Finally, another purpose of public relations is to enhance the prestige of the forestry sector, which should not be held in less esteem than other sectors of the economy, the civil services, education, research, etc. Enhancing the prestige of its own PFA's means strength-

ening support to the forestry sector in terms of staffing and financial means.

Virtually all PFA's have recognized the need for good public relations and are concerned with this matter as part of their work. Many countries have special public relations units in their PFA's, or else they make use of such units in other parts of the civil service. For instance, the PFA's of Colombia, Chile, Cuba, Ecuador, Mexico and Peru have their own public relations units under different names. The placement of the public relations unit directly under the head of the PFA seems best because of the kind of work done (Colombia, Mexico, Peru). The PFA's in other countries have joint public relations units with the Ministries of Agriculture (Costa Rica, Jamaica). Chile coordinates its public relations unit for forestry with that of other agricultural sectors through a communications coordination committee that also has access to the "Oficina de Informaciones del Gobierno"^{1/}.

6.2 PFA's and the World in which they work

PFA's maintain liaison with the world outside through public relations work; in other words, by addressing individuals, groups of persons and public or private institutions from the president of the republic down to the worker, the man in the street, the housewife and the child. All these persons have some ties, experience or familiarity with forests, comprehend their influence, and have opinions regarding their own relations with the forestry sector and the importance thereof. Public relations units must carefully consider public opinion and attitudes in order to obtain good results in their work. Eight different groups of people have to be reached, viz:

- (1) The general public, composed of individuals with any sort of social, educational and occupational background. In this instance the main purpose of the public relations unit is to build up a favourable attitude and behaviour with regard to the forestry sector, to gain support for the protection of natural resources and to encourage their use for recreational purposes;
- (2) Groups of interested persons: sports, tourist and nature lovers' clubs; hunters and fishermen; photographers, etc. Public relations work should be slanted to the special interests of such groups and their specific requests;
- (3) Journalists and newspaper writers interested in obtaining general information regarding forestry affairs, and especially in current problems (reforestation programmes, water supply, pest control, fire prevention, etc.). It is very necessary to maintain contact with journalists and newspapermen not only as a means of reaching the general public, but also to dissipate false ideas and opinions circulating among the public with regard to the forestry sector;
- (4) All other sectors of the national economy that form part of the world outside the PFA's, liaison with which varies in degree of intensity. Public relations work with these sectors has to be differentiated in accordance with the specific ties between them;
- (5) A very significant sector of the world outside the PFA's is the civil service or the public administration, ranging from other departments within the same ministries to other ministries and regional, provincial and communal administrations. The foundations for creating a situation favourable to forestry projects can be laid by bringing the interests of all these administrations into line with that of the forestry sector (see Chapter III; "Interrelations");

^{1/} Representatives of Belize, Guyana, Jamaica and Surinam participated in an FAO/SIDA Seminar on Forestry Social Relations for English-speaking Countries in Africa and the Caribbean, held in Rome from 1 to 26 April 1974. This seminar recommended that all PFA's have their own social relations units.

- (6) The official planning agencies, a special branch of the public administration responsible for national plans, regional plans, town- and country-planning, and planning for water supply, electrification, road construction, etc. In Chapter III reference was also made to the interactions with this important branch of the administration;
- (7) The educational system. The familiarization of school children and students with the forestry sector in the long run promotes better understanding among the public and the future ruling class. Education has a multiplier effect, that is, students transmit ideas to their families and associated groups of persons. In order to prepare and channel this type of public relations work, it is essential to earn the collaboration of professors and teachers by offering them detailed information and information materials;
- (8) Finally - also very important - the national congress, which has to be supplied with all information necessary for the taking of decisions by deputies with regard to forest laws, other laws pertinent to the forestry sector or the budget and staffing of forest services.

To sum up, in public relations work the world outside the PFA needs to be taken into account. The ways and means for conducting public relations need to be adjusted according to the persons for whom they are intended through well planned short-, medium- and long-term programmes.

6.3 Information Media and Programming of Public Relations Work

The main media at the disposal of public relations services are:

- | | |
|------------------|----------------------------|
| - bulletins | - radio and television |
| - lectures | - practical demonstrations |
| - press releases | - exhibitions |
| - films | - special archives |

As a rule, bulletins reach the largest number of people. The texts should be very clear and the presentation attractive. Many countries use this medium for their public relations work (Chile, Guyana).

Lectures or talks offer two advantages: personal contact and opportunities for asking questions. They are therefore very suitable for schools, universities and industrial unions and trade unions.

Press releases or press conferences with journalists and newspapermen. It is advisable that written material be distributed ahead of time in order to prevent inaccurate reporting. Contact with members of the press is vital and should be made at regular intervals, though not to the exclusion of ad hoc conferences in case of important events. A very attractive form of press information are group study tours, during which very direct information is obtainable. It is also advisable for forestry authorities and experts to prepare original press releases from time to time. All countries use this public relations medium to varying degrees.

Films are directed primarily to the general public and to school children in particular. They can therefore deal with problems of general interest (forest fires, insect pests and diseases, the environment, soil erosion, reforestation). It would be advisable to introduce such films in public cinemas and also in regular school courses. For school curricula it is advisable that written information be distributed so that the teachers can give additional explanations.

The mass media are of course radio and television, and these are used by the PFA's of many countries (Argentina, Brazil, Colombia, Jamaica, Paraguay). Such broadcasts should be carefully prepared and give the maximum of real information, clear explanations, and be

presented in an attractive form. An interesting way for answers to be given to questions of interest to the public is through interviews between a journalist and a forester.

Practical demonstrations are suitable for fairly small, homogeneous groups. The advantage is that participants can acquaint themselves with the forest environment or the forest industry thus stimulating discussion and comprehension of practical problems.

Exhibitions offer the possibility of bringing a great many people interested in the subject into contact. Samples, explanatory models, photographs, graphs, films and sometimes short talks offered from time to time can be used. Aside from the material presented, the location of the exhibition is very important in order to attract the public. From the answers to the National Questionnaire, some instances of the use of this medium emerge (Chile, Jamaica). Forestry exhibitions can be organized as part of exhibitions on broader subjects as well.

Teaching materials for interested persons (publications, models, etc.) are kept in archives, where all kinds of other useful materials for public relations work are stored.

Whatever the media used by the public relations units, the following ethical principles must be observed: frankness, truthfulness, love of justice and self-criticism. Observance of ethical principles is not only essential per se, but is a prerequisite for the success of the work of public relations units and for enlightening the public. One methodological rule is that public relations work has to be pursued regularly and continuously. The success of public relations work hinges to a large extent on reaching those persons or groups of persons who form public opinion. Influencing public opinion makers (politicians, high public officials, churchmen, scientists, representatives of the people and radio commentators of high reputation) has a very important multiplier effect.

Public relations work also requires appropriate planning based on analysis of requirements. The best sources for such analysis are public opinion polls among a representative sampling of the population, comprising:

- sounding of individual opinions regarding the forestry sector, i.e. forestry work, programmes, plans, projects, the attitude of forestry staffs, etc.
- determining what services and influences individuals expect from the forestry sector, i.e. demand analysis; and
- identifying existing and potential conflicts between individuals and the forestry sector.

The selection and development of topics to be dealt with by the public relations units will depend on the outcome of such soundings. The next step is to select the most appropriate media for such public relations or extension work (the press, television, etc.). Finally, checking on results of the work of public relations units needs to be planned. Here again, public opinion polls can be used, although normally personal interviews with representative persons is more fruitful. The outcome of such feedback is fundamental for the improvement of subsequent programmes or information campaigns.

CHAPTER VII

ORGANIZATIONAL IMPROVEMENT

1. ADJUSTMENT TO CHANGE: REQUIREMENTS AND PROCEDURE

1.1 Determination of the Need for Reorganization and Diagnosis

The organic structure, and the administrative/technical procedures of PFA's, like those of any other agency, are determined at a given moment according to the circumstances of that moment. But even then, the actual organization is a compromise between an ideal solution and existing constraints. So, to a certain extent, any solution already entails a need for reorganization when it is being adopted. Furthermore, considering changes in external conditions, goals, technology, etc., as time goes by it becomes evident that any agency needs constant readaptation as far as its structure and administrative/technical processes are concerned.

It therefore seems necessary to systematize the process of problem analysis to achieve a purposeful and effective reorganization. The main steps in systematic reorganization may take the following sequence:

- investigation of the need for reorganization;
- diagnosis of the present situation of the agency;
- devising models for different combinations of functions and activities;
- comparing the current situation with the models and identifying the necessary changes; and
- 5) checking and evaluating the results of reorganization.

Once a decision is taken in principle that a reorganization should take place, a preliminary assessment of the present situation is made in the light of long-term goals. The current situation is reflected in the organizational set-up, type of management, administrative/technical procedures, etc., and above all in the performance. During this initial phase it is neither possible nor necessary to make an accurate diagnosis of the situation. Subsequently, the present achievements are compared with the objectives of the PFA, such as they are prescribed in the forest policy, always taking into account whatever constraints exist. Such comparison throws light on how well goals are being reached and on shortcomings and deviations. It confirms whether or not there is a need for reorganization^{1/}. The question then arises as to whether all these difficulties or some of them can be resolved by non-organizational measures (amendment of laws, a better definition of the forestry sector, improvement of relations with other institutions, and so forth). If the conclusion is reached that it is advisable to reorganize, the problems have to be clearly defined, that is to say, an accurate diagnosis of the situation had to be made.

Normally the management decides then who will carry out the reorganization. If there is an organization and methods unit (O+M), it should be consulted from the outset, as this unit is the one that usually becomes the "reorganizer". Otherwise the management selects as reorganizer either a task force from its own staff, a specialized consultant firm or, better still, a combination of both. Its own staff usually lacks the necessary perspective or

1/ Apart from obvious discrepancies between goals and achievements, certain other symptoms may indicate a need for reorganization, namely overlapping of competence, complaints from users, dissatisfaction of personnel, accelerated rise in costs, etc.

objective approach to problems as well as specialization in O+M methodology. In any case, the "reorganizer" must have free access to all necessary information, an opportunity to participate in the practical application of administrative/technical procedures, and a chance to attend meetings at top managerial level. Only thus will the reorganizer be in a position to put forward a reorganization plan. It is essential that management identify itself clearly with this reorganization plan and give it full support.

1.2 The Reorganization Process

The reorganization plan will analyze and offer solutions to problems in fields such as:

- structure of the organization;
- delegation of responsibility;
- participation in decision-making, in managing and in instructing;
- the processes of management and direction;
- breakdown of administrative/technical tasks;
- technology applied to administrative and field work;
- methods of control, evaluation and information.

In dealing with problem areas such as these one begins with a detailed investigation of the present situation. Then an ideal model for each problem area has to be worked out and developed by the reorganizer, taking into account the ultimate goals. The third step will consist in making a comparison of the current situation with the ideal model, thus identifying whatever discrepancies or malfunctioning there may be, always analyzing the causes. Depending on the causes, the necessary changes will be planned in detail, including implementation measures.

Once this has been done for each problem area, the changes have to be coordinated in order to avoid friction and inconsistencies. All measures have to be harmonized and combined to arrive at a functional set-up. During this phase, supplementary measures should also be considered (staff training, cooperation with other institutions, changes in working relations with other agencies, and so forth).

Finally, the restructuring of the organization will be put into effect, taking care that the results correspond to the overall purposes of the reorganizational plan. During this phase constant watch will be kept on the progress of this rationalization, eliminating whatever material or personal obstacles there may be and keeping the process geared to the desired results. Some details of the analysis and suggestions as to applicable methodology will be found below.

1.2.1 Organisational structure

The first step is to get a clear idea of the set-up of the PFA, e.g. of its different levels (central, regional, local) as well as of the vertical segmentation at each level (departments, divisions, sections, etc.) including the bodies associated with the principal set-up (research institutes, councils or boards, etc.). The type of organization has to be taken into account (line, staff-and-line, etc.). All this is done by studying organizational charts and interviewing staff.

The second step consists in analyzing the actual and the prescribed tasks of each unit. These tasks will preferably be grouped by kinds of activity and by the purposes set. The sources of information are the agency's rules and regulations, special instructions (orders), job descriptions and staff interviews in order to determine what work is actually being done. Any malfunctioning or deviation from prescribed work will be noted and the reasons analysed.

The third aspect to be analyzed are the mutual relations between the units of the vertical and horizontal divisions within the PFA as well as those between it and outside bodies (other agencies of the same ministry, other ministries, other agencies of national

and local administrations). Not only should the contents or substance of such relations be analyzed but also the flow and manner of communication and the composition of the interdisciplinary groups. Mutual relations must also be studied both from the standpoint of the organic structure and from that of assignment of duties.

This analysis has to be completed by comparing the stated objectives with actual work accomplished, noting the ties among various institutions, any duplication or failure of performance of work, communications, etc.

1.2.2 Delegation of responsibility

By means of such a structural analysis it is possible to get to know how work is assigned to various posts and organic units. At this point it is possible to analyze the assignment of functions to each set of tasks or activities. It should be remembered (cf. Chapter III) that the basic functions are: decision-making, commanding, participating, instructing, executing, controlling or monitoring, and cooperating. In general, it can be stated that for each set of tasks or activities it is necessary to stipulate clearly who makes the decisions, who issues orders, who gives instructions, who executes orders and who controls (and in many cases, who participates and who cooperates). For such analysis it is advisable to use functional diagrams. FIGURE 46 gives such a diagram, indicating functions having to do with the preparation of a management plan.

Should there be no functional diagrams or charts, these must be prepared on the basis of manuals, rules and regulations, job descriptions and interviews. In this exercise it is advisable to see who substitutes for the incumbent of a post when he is absent. The functional charts indicate first of all whether all functions have been assigned. In actual fact, very often one or another function may not have been assigned, leaving gaps and conflicts of competence. The charts or diagrams also indicate which groups of activities are connected with a certain function of two or more persons or units, and show up any lack of cooperation between units that are partially responsible for the same work. The diagrams also disclose the extent of communication of key functions (decision-making, transmittal of instructions and, to a certain point, implementation), that is, the degree of concentration of responsibilities within the PFA. This can be compared with the desirable degree of delegation of responsibilities or deconcentration, keeping in mind the principle that decision-making and execution responsibilities should be delegated to the lowest level capable of fulfilling these functions. This principle also corresponds to that of "management by exception" and "management by objectives". (In Chapter III, Section 4, these principles were defined and their advantages explained.) The functional diagrams also make it possible to analyze the scope of control (see Chapter III) and to compare it with the ideal solution.

1.2.3 Participation in decision-making, directing and instructing

In organizing each task, the responsibility for functions related to decision-making (taking decisions, directing and instructing) must be placed squarely upon a single person or a single post, because the responsibility for making decisions is indivisible. Of course, this does not refer to either the work of preparing decisions or to their execution. The functions of directing and instructing are part of a process involving many persons and consist of several phases: motivation, information, orientation, taking of resolutions, decision-making and implementation. Of these phases those of information and orientation or guidance are very important because it is on them that the quality of the decision taken will depend. During these phases there must be access to all necessary and available knowledge, and this has to be evaluated. That is why the participation of experts who assemble and evaluate information and data, weigh the various alternatives and forecast their respective consequences, is most valuable. The quality of the high-level decisions actually reached will depend to a large extent on the degree of genuine participation in these various phases, since such decisions can only rarely be taken by a single person because of the innumerable consequences many of them have and the limits of individual capacities.

The absolute requisite for such participation is open and frank discussion which does not prejudge the final result. Of course, it is mainly the higher-echelon staff of the

FIGURE 46

FUNCTIONAL DIAGRAM

Preparation of a Management Plan

Units of the PFA Tasks or Activities	Ministry of Agriculture		Forestry Institute	Regional Office		Area Chief (local office)	Planner	Deadline
	Head of the PFA	Management Dept.		Chief	Management Dept.			
1. Start of the planning process	Dex	Dn	i	i		i		Jan. 1
2. Selection of planner		i	i	D	P	i	i	Jan. 15
3. Report on results of past management		C ₂	i		C ₁	E	i	Feb. 15
4. Report on the current situation		C ₂	i		C ₁	E	i	Feb. 15
5. Proposals for the plan (problems, solutions)		C ₂	i		C ₁	E	P	Mar. 10
6. Background analysis and definition of special goals and methods		D	(P)	P	P	P	P	Mar. 25
7. Maps, cadastral records, aerial photographs			P		C ₂	C ₁	S	Mar. 15
8. Demarcation and division of land area (sections, sub-sections), topographical survey			E ₂		C	P	E ₁	May 15
9. Map preparation			E ₂		C ₂	C ₁	P ₁ E ₁	Sept. 30
10. Forest inventorying (type of stand, tree species, diameters, volumes, increment, etc.)		C ₂	E		C ₁	i	P	May 31
11. Planning by section and by sub-sections (felling, reforestation, road construction, etc.)			i		C	P	E	July 20
12. Collation of results (No. 11), calculation of probability, with alternatives		i	i		C	P	E	Aug. 15

.../...

(Fig. 46, continued)

Units of the PFA Tasks or Activities	Ministry of Agriculture		Forestry Institute	Regional Office		Area Chief (local office)	Planner	Deadline
	Head of the PFA	Management Dept.		Chief	Management Dept.			
13. Assessment of impact of alternative plans on employment, sustained yield, research, cost/output analysis, finances & proposal of final plan		i	(i)		C	P	E	Aug. 31
14. Check-up and evaluation of activities from No.7 to No. 15 (out in the field)		E(D)	P	P	P	P	P S	Sept. 20
15. Approval of a draft plan incorporating agreed changes		D	P	P	P	P	P	Oct. 10
16. Reformulation of the plan		C ₂	i	C ₁	(C ₁)	F	E	Nov. 20
17. Justification for the plan				C ₁	(C ₁)	P	E	Nov. 20
18. Approval of the plan and its implementation	D	P	i	i	i	i	i	Dec. 31

Nomenclature

- D - Decision
- P - Participation (Consultation)
- E - Execution
- C - Control
- S - Supplies
- i - Information

The sub-indices "n" and "ex" signify normal and exceptional cases respectively.

The sub-indices "1", "2", etc. indicate the sequence in the processes; for instance: C₁, C₂ indicate first and second checkup; the higher figure corresponds to the higher level of responsibility.

PFA's which have to participate in such discussions (the Director-General, the heads of departments and regional offices, etc.), as their decisions have the widest scope.

Finally, it is advisable to analyze the kind of participation in which staff should be involved, and for this purpose it is well to observe how meetings are conducted, because rules and regulations or manuals do not often contain precise information on this point. The study of rules and regulations can offer some guidance as to the formal aspects of decision-making, but the organizer himself is the one who must personally know how decisions are reached in discussions and meetings. In order to analyze a discussion methodically, the organizer can avail himself of a form like the one presented in FIGURE 47. By applying a scheme worked out by Schein (1949) various aspects of participation in the work of any group can be analyzed, e.g. the managerial staff, boards, departments, sections, etc., or

FIGURE 47
FORMAT FOR ANALYSIS OF A DISCUSSION

Date

Problem

Personnel administration
Organizational structure
Budget
Forest policy
Administrative procedures
Technical procedures
Public relations
etc.

☐
☐
☐
☐
☐
☐
☐

Special topic

Background information

Type of discussion

For information only, no discussion
Proposal, consent, no discussion
Discussion and final decision
Discussion and decision requiring
additional information

☐
☐
☐
☐

Name of each participant No. (function)	Extent of participation ^{1/}	Directed towards whom? No.	Concurring with whom? No.	Contradicting whom? No.	Interrupting whom? No.	Remarks
1						
2						
3						
.						
.						
.						
.						
.						

^{1/} Initiative: 1

Participation in the discussion: strong 2

weak 3

none 4

FIGURE 48
ANALYSIS OF QUALITY OF TEAMWORK
(according to Schein)

Subject (Problem)	Quality Grade 1: poor	Quality Range										Quality Grade 10: excellent
		1	2	3	4	5	6	7	8	9	10	
Purposes	Confused, contradictory, unknown, non-existent											Clear, specific, accepted by all
Participation	Dominated by a few participants; the majority passive; persons speaking at the same time; interruptions											Balanced discussion by many participants; constructive contributions by all
Leadership	In the hands of a single person; other capable persons are stymied; leadership requirements not satisfied											The function of leadership can be performed by several members; each takes part if required by group
Decisions	Lack of decisions; decision taken only by a single person without real consent of the rest											Concurrence in decision is sought; different opinions are accepted; final decisions supported by all
Creativity	Routine-bound attitude; inflexibility; lack of progress											Flexibility of the team; seeking of best solutions; "progressive" group
Confidence	Mutual lack of confidence; criticism avoided; no frank expression of opinion											Mutual confidence; frank information; expression of contradictory opinions not repressed
Personal Reactions or Feelings	Not accepted and personal reactions criticized											Free expression; acceptance even of vehement reactions
Group Diagnosis of Problems	Spontaneous proposals without prior analysis; symptoms rather than causes are dealt with											Careful diagnosis; causes are looked into; alternative solutions are worked out

administrative units (computer sections, accountancy section, etc.). This scheme can also be used by any member of a group to examine his own judgement or opinions (FIGURE 48).

By comparing the real with the ideal extent of participation it is possible to examine with the chairmen or moderators of the meetings what changes it would be advisable to introduce.

1.2.4 Processes of direction and management

The heads of the PFA's and the chiefs of the regional and local offices are responsible for direction and management. In special cases it is possible to include in the analysis the heads of branch offices (or research institutes, etc.) and heads of departments. For such an analysis there are no standardised schemes, rather the methods have to be suited to various circumstances and situations. Therefore only a few suggestions will be made here.

The first topic for analysis may be time spent by heads on various problems and matters (forest policy in the strict sense of the term, organisation, planning, budgeting, relations with other institutions or agencies, inspection and travel, public relations, and so forth). The necessary information can be obtained from the daily records of the heads, from instructions issued, from minutes of meetings and from observation. It would be very valuable to have their own explanations as to actual time used versus desirable employment of time.

The second topic may be time spent by the heads in exercising various functions, e.g. how much time they spend on decision-making, in the execution of plans, in control and inspection work, on information work (receiving and disseminating), participation, etc. in the light of their various responsibilities. Such an analysis can be based on the functional diagrams, as already mentioned. In this way it is possible to determine the real weight of the various functions and to consider how more responsibility can be delegated to others. It would also be worthwhile to investigate the amount of time that heads spend on in-the-house and outside meetings.

The third topic for analysis is decision-making and the various forms of command. The methods already mentioned in speaking of participation can be applied in analyzing how heads make their decisions. Their knowledgeability, their weighing of alternatives, the clarity of their final decisions as well as the arguments in favour of their decisions, the means for implementation and the manner of communicating decisions to subordinates (instructing) should be analysed. Finally, it is advisable to study human relations and how the chiefs organize their work.

1.2.5 Breakdown of technical/administrative work

Having analyzed the tasks and activities carried out in the various units from the standpoint of structure (of. 1.2.1), it will be well to consider them again from a different standpoint, namely breaking them down into a series of "steps" to see how they are performed and executed. Each set of tasks has to be broken down into a sequence of steps, always making sure that all individual steps are logically congruent and serve the overall purpose. There are various guidelines for a breakdown into a step-by-step sequence: the need for specialisation of staff, the similarity of purposes, the use of the same machinery, similar or common sources of information, communication channels, etc. It is also necessary to investigate how much time each step of the task requires, applying the work/time research method.

The first thing to do is to examine the existing breakdown of jobs by organic units. Then the possibilities of reassignment or shifting of tasks and the variations in their composition need to be analyzed without taking into account existing units or rules. In this way the step-by-step flow of work, the transmittal of results to other units and posts, the deadlines for the various steps of the task will be analyzed too. Any possibilities for speeding up the work, improving accuracy and communication, eliminating conflicts and reducing costs - in short, the possibilities for improving efficiency - will also be assessed. In this analysis it is highly advisable to use the PERT system to analyze each step,

the sequence of, and connections between, steps as well as the setting of deadlines. It is advisable also to plan for the provision of the necessary staffing/manpower, materials and funds.

1.2.6 Techniques applied for administrative and field work

First of all the techniques used in administrative processes must be analyzed, but it is also necessary to analyze field work (in districts or areas). It is recommended that techniques be analyzed in conjunction with the job breakdown considering the techniques used in each step.

Given the scope and diversity of the techniques requiring analysis, mention will be made only of a few typical subjects: implements and tools, machinery, records, archives, schedules, documentation systems, forms, communication media (letters, telephone, radio, etc.), periodical reports, maintenance and repair services, messenger services. The technical processes must be analyzed as coherent wholes and the work/time study method is recommended.

The technical instructions on execution of various steps and processes (budgeting, use of machinery, and so forth) provide valuable information for such analysis. In this respect it would be advisable to ascertain the degree of standardization of technical processes, as compared with the desirable extent of standardization.

1.2.7 Methods of control, evaluation and information

The main purpose of control is the improvement of the technical/administrative processes in the light of achievements. The material, financial, economic and social results have to be analyzed, comparing them with the corresponding plans or instructions. By analysing the discrepancies it is possible to discover their causes and consequently to change future procedures, while encouraging efforts of the responsible staff. Control is a vital function, yet appropriate methods of control have been developed only lately, except as regards auditing of budgets. Control implies neither confidence nor lack of confidence in individual staff members, each of whom is entitled to undergo controls to obtain an efficiency rating or to open the way for correcting or improving certain aspects of his work.

The most usual control methods are: regularly written work progress reports (with additional forms, statistics and explanations), accountancy, special written interrogation and on-the-spot inspection. Both regular and occasional on-the-spot inspections are to be recommended as they offer an opportunity for dialogue between the staff member and his superior, frank discussion being the best means for bringing about improvement.

Evaluation of achievements through such check-ups or control consists in comparing the plan with actual achievements in material, financial and socio-economic terms. For evaluating the economic results analytical methods are used, one being cost/benefit analysis. Evaluation should both explain the reasons for good or bad functioning and give an idea of consequences for future processes. Those responsible for systematic evaluation are the immediate superiors and/or the respective departments, sometimes jointly with experts of the O+M unit. In studying the control function it is necessary to analyze how information comes into play in all activities and procedures of the PFA.

2. ORGANIZATION AND METHODS SERVICES (O+M)

2.1 Terminology

The term "Organization and Methods" (abbreviated O+M) covers above all the efforts which are made to improve the PFA or any other administration or civil service and/or enterprise at all levels. Improving a PFA may entail restructuring and reorganizing its procedures with regard to both physical means (accountancy, information system, techniques,

etc.) and personnel (management, transmittal of instructions, communication, etc.). The term O+M is also used to designate the organic unit in charge of such work.

The task of organizational improvement dates back to the earliest organizations, such as the administration of the Roman Empire, the Church, the Armed Forces, the Navy and State Public Administrations. In old times, the heads and officials of organizations occasionally themselves attended to organizational matters as a marginal duty to their permanent functions. Reorganization used not to be considered a specific, permanent task. But in recent decades the improvement of organization has been recognized as a well-defined, continuing task worth being entrusted to a unit having specialized staff for that purpose. Nowadays big business and public administrations usually have organic units charged with the function of organizational improvement. Not all PFA's are sufficiently large to have such units, but all should have access to such services.

In order to designate the work of organizational improvement the following Spanish terms are used: "racionalización administrativa" (Peru), "mejoramiento de la organización", "desarrollo de la organización" and "cambio planeado de la organización", although the term O+M is the most usual^{1/}.

2.2 Tasks of O+M Units

The main tasks of O+M units pertain to the improvement of: (a) organizational structure; (b) administrative procedures and technical processes; and (c) management. We have already indicated in this chapter what these tasks consist of and what purposes are intended to be served. Here we shall confine ourselves to referring briefly to how these tasks are assigned to O+M units servicing the PFA's of Latin America.

How an O+M unit is concerned with structure, for instance, is shown by the rules and regulations governing the organization and functions of Ecuador's Ministerio de Agricultura y Ganadería. These rules require the O+M unit to "analyze ... the organic structure and physical space arrangements inside the ministry; prepare structure and functional organizational charts for the various administrative units of the ministry; and coordinate the structure of the various branches of the subsector". Mexico's and Peru's rules and regulations contain similar provisions.

Procedural improvement is sometimes focussed on a single technique, for instance the changeover from manual calculations to the use of computers or from individual stenographic service to centralized pools. A point to be taken into account is that the change of one technique is likely to entail changes in other activities as well, so it is recommended that the set-up be reviewed as a whole. With relation to administrative procedures and technical processes, Mexico's O+M unit is expected to "analyze constantly the administrative functioning of the Secretariat and study the administrative aspects of plans and programmes of work of the Secretariat with the idea of suggesting appropriate measures". In Peru there are similar provisions to "advise the organs of the Director-General's office and the executive bodies of the subsector on the improvement of administrative procedures in accordance with directives of the Oficina Sectorial de Planificación Agraria (OSPA).

Procedures for improvement of management are contained in manuals of Colombia, Ecuador and Peru, dealing for instance with rules for communication with branches of the Central Office. In Ecuador the problem of communication between the ministry and regional delegations is also confronted, as is the coordination with associated bodies. In the latter country certain provisions contemplate assistance in preparation of rules and regulations and forms, calling for "assisting the administrative units of the ministry in the formulation of rules and regulations, manuals and instructions; designing, recasting and reviewing forms required by the administrative units of the ministry".

1/ See: M.E. Askersten - "Planning for O+M Services and their Utilization in Public Forestry Administrations". Doc. FO:MAFP/LA/75/7 presented to the Seminar on Modernization of Public Administration in the Forestry Sector of Latin America (Lima, Peru, 10-29 November 1975).

2.3 Organization of O+M Work

There are several possible modalities or variants in the organic structure of those O+M services that now make up part of PFA's in Latin America or assist them within the framework of larger administrative systems:

- (a) In Colombia INDERENA has an O+M section in its Administrative Office that advises management on the setting of norms for all its branches. This solution offers the advantage of concentration on problems of the institute, which is important if the O+M unit also has to deal with the technical aspects of field work (at the local level), because it is easy to have the staff of the unit familiarize themselves with these. In Peru an O+M unit within the Programming Office, aside from making basic studies, also trains staff at all levels in streamlining administration according to directives of the OSPA.
- (b) The PFA's of certain other countries have O+M services rendered by other units. Guatemala, for instance, has a technical unit that, aside from its main activities, deals with some O+M matters.
- (c) The third and most frequent solution, from an organizational standpoint, has a special O+M unit servicing all branches of the Ministry of Agriculture. In such a case any problems of the PFA are dealt with as part of the whole ministry. Bolivia, for example, has a special commission inside its ministry. In Paraguay the Auditing Office covers administrative aspects while the Director's Office of the Ministry of Agriculture renders O+M services in technical matters. In Ecuador, the Administrative Programming Department of the Planning Office has an O+M section. This section (founded in 1966/67) has three officials specialized in public administration (holding a degree in this subject).

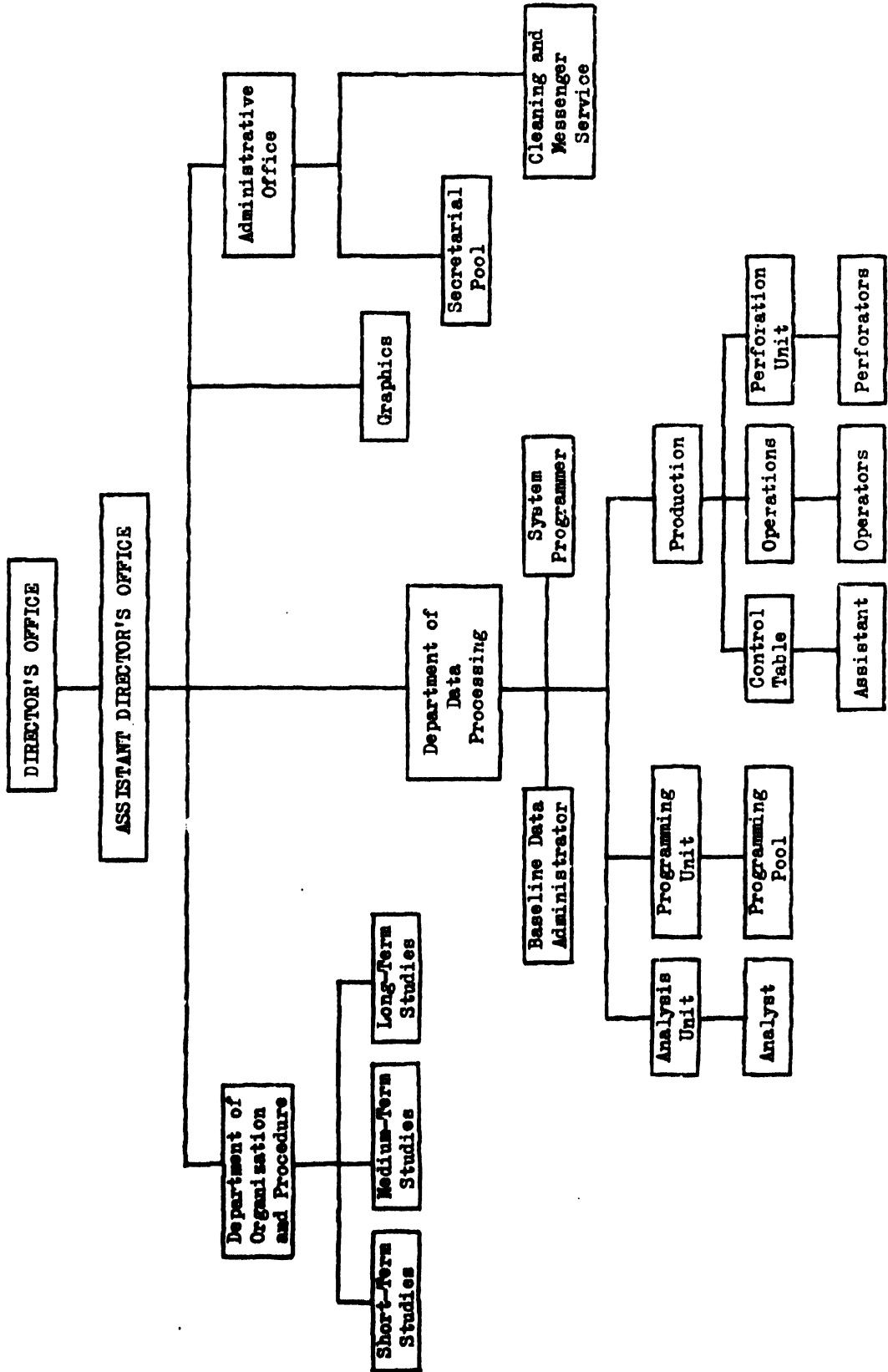
In Mexico, the Oficialia Mayor (Head Office) of the Secretaría (Ministry) de Agricultura y Ganadería handles problems of a wide range through its O+M unit which has a well developed infrastructure. This O+M unit has branch offices in each major organic unit of the Secretaría; these branch offices are composed of a Director-General, administrative delegates and appointees of the Director. Thus, on the one hand, specialized cadres are assembled and on the other hand the various parts of the Secretaría are organized on a broad information base, which smoothes the way for implementation of any planned changes. The O+M unit of the Oficialia Mayor has 13 analysts with interdisciplinary backgrounds and receives assistance from the university. The organic structure of this unit is shown in FIGURE 49.

- (d) Guyana has a fourth type of O+M service. The rules and regulations that are applicable to the PFA are drafted by other services, e.g. the Management Service or by other ministries, e.g. the Personnel Division of the Ministry of Public Services.
- (e) Finally, mention can be made of the variant which is based on systematic staff training in organization analysis and improvement. In Peru, the "Instituto Nacional de Administración Pública" (INAP) offers courses on administrative improvement for all public officials. This is a very important contribution for O+M purposes and helps inculcate in the staff an understanding of the necessary reforms. Such personnel training not only stimulates the work of O+M but also induces employees to reorganize their own work. It would be worthwhile creating within PFA's a service for the collection and examination of staff suggestions for improvements. In addition, one might consider offering prizes or bonuses to staff members who make suggestions on reorganization, techniques, etc. that can improve the PFA in any respect.

FIGURE 49

STRUCTURAL CHART OF AN O+M UNIT

(Mexico: Secretaría de Agricultura y Ganadería)



CHAPTER VIII

PROBLEMS, CONCLUSIONS AND RECOMMENDATIONS

1. PROBLEMS CONFRONTING PUBLIC FORESTRY ADMINISTRATIONS

The National Questionnaire sent to the PFA's for the preparation of this study contained the following important question: "Which, in your view, are the principal organizational and administrative problems confronting the PFA?"^{1/}

The replies to this question are summed up in FIGURE 50. In some instances the replies came in writing and in other cases they were expressed in interviews or at meetings. Occasionally, the degree of seriousness of the problems was mentioned; at other times this could be inferred from further explanations and the order in which the problems were put. All in all, a fairly large and diversified sample of opinions of qualified persons (heads of PFA's or officers with considerable experience and responsibility) was assembled on the main problems and their relative gravity.

Without claiming that this sample has any statistical validity - which is not the case - it seems possible to utilize it by assigning numerical values to the problems mentioned. These problems, classified according to their importance, were given ratings that range from 1 to 5. If more than five problems were mentioned, all those mentioned in fifth place and all that followed were grouped together under 5. Then a rating of 5 to 1 was given to those in first to fifth places respectively. The sum of the weights thus assigned to each problem is given in the last column of FIGURE 50. In this way some idea of the order of importance was obtained (first column).

The lack of adequate financial resources of PFA's is mentioned eleven times (rating 1). Only five times was it mentioned that there are not enough posts to secure proper functioning of the organization (rating 6). The question arises as to whether the lack of financial resources refers mainly to the execution of field work. Since dearth of funds is a problem common to all public administrations, it would be interesting to investigate whether the PFA's, in view of their relative importance, are less favoured in budgeting than other sectors of the public administration.

The seriousness (rating 4) of insufficient staff training is alarming. One of the main handicaps of any organization is having staff unable to perform its work, either in volume or in quality of output, due to inadequate professional competence. Apparently the problem arises in part because education in the field of forestry is not always directed towards meeting the practical needs of the PFA (rating 14). Another reason may be the excessive workload due to the fact that there are not enough posts available, which obliges the staff to deal with problems for which it is not trained. Low salaries also depress work output and quality; some officials are forced to work outside the PFA, others, very often the best, go into the private sector. Concentration of decision-making, with little delegation of

^{1/} This same question was put to the heads of certain PFA's during visits to their countries and to the participants in the FAO/SIDA Seminar on Forestry Development Planning (Quito, 30 June - 8 August 1975). It also took into account the problems exposed to F. Barrientos (F. Barrientos - "Informe al Gobierno de Venezuela sobre una misión preparatoria de un programa de asesoramiento sobre recursos naturales renovables", Caracas, 1974). In all, the replies of 28 qualified persons from 15 countries were reviewed, namely: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, El Salvador, Guatemala, Guyana, Mexico, Nicaragua, Paraguay, Peru, Uruguay and Venezuela.

FIGURE 50
SPECIFIC PROBLEMS OF PUBLIC FORESTRY ADMINISTRATIONS
(in estimated order of importance)

Order of Importance	Specific Problems	Number of times mentioned							Total Weight
		Total Number	rating						
			1	2	3	4	5		
			Weight attributed to problem						
		5	4	3	2	1			
1	Insufficient funds	11	3	1	4	1	2	35	
2	Lack of well defined forest policy	8	4	3	-	1	-	34	
3	Shortage of technical staff	8	-	3	2	2	1	23	
4	Insufficient staff training	8	2	1	1	-	4	21	
5	Poor relations with the rest of the public administration	5	1	2	1	-	1	17	
6	Inadequate number of posts	5	1	2	1	-	1	17	
7	Small size of the PFA	3	2	-	1	-	-	13	
8	Dispersal of functions pertaining to forestry among other agencies	3	2	-	1	-	-	13	
9	Over-concentration	4	1	1	-	1	1	12	
10	Inadequate definition of the forestry sector	3	-	3	-	-	-	12	
11	Dearth of professional staff	4	1	-	1	1	1	11	
12	Dearth of administrative staff	5	-	1	1	1	2	11	
13	General shortcomings in the organizational structure of the PFA	2	2	-	-	-	-	10	
14	Poor orientation of forestry education in the light of requirements of the PFA	3	1	1	-	-	1	10	
15	Lack of regional or local offices in the PFA	3	1	-	-	2	-	9	
16	Too many forest laws	2	1	-	1	-	-	8	
17	Salaries too low	4	1	-	-	-	3	8	
18	Deficiencies in the administrative procedures	3	-	1	-	2	-	8	
19	Imbalance of different levels of the organization	3	1	-	-	-	2	7	
20	Lack of public interest in forestry affairs	2	1	-	-	-	1	6	
21	Dominance of other sectors causing unsound exploitation of forests	4	-	-	1	-	3	6	
22	Failure to implement administrative and technical processes	2	1	-	-	-	1	6	

(Fig. 50, continued)

Order of Importance	Specific Problems	Number of times mentioned						Total Weight
		Total Number	rating					
			1	2	3	4	5	
			Weight attributed to problem					
			5	4	3	2	1	
23	Lack of forest guards	2	-	1	-	1	-	6
24	Poor relations with non-governmental groups and associations	1	1	-	-	-	-	5
25	Insufficient independence in decision-making and in staff activities	1	1	-	-	-	-	5
26	Lack of control systems	3	-	-	1	-	2	5
27	Poor coordination among federal and state forest services	1	-	1	-	-	-	4
28	Poor discipline	1	-	1	-	-	-	4
29	Lack of definition of responsibilities	1	-	-	1	-	-	3
30	Poor internal communication	3	-	-	-	-	3	3
31	Poor results from public relations work	1	-	-	1	-	-	3
32	Lack of clear job descriptions and post classifications	1	-	-	1	-	-	3
33	Poor research to solve the problems of the sector	1	-	-	-	-	1	1
	TOTALS:	111	28	22	19	12	30	339

Sources: Replies to the National Questionnaire; interviews with the heads of PFA's and with participants in the FAO/SIDA Seminar on Forestry Development Planning (Quito, 30 June - 8 August 1975).

responsibility (rating 9), not only blocks growth of ability, but may also give rise to the false impression among superior officials that their staff abstains from making decisions because it is incompetent.

The problem of inadequate competence can be solved through better university and technical education. It is also advisable to establish an on-the-job training system (see Chapter IV). The good results of such training can offset in part the inadequate number of staff (ratings 4, 11 and 12). In order for this problem to be properly solved, a sufficient number of posts with competent staff to fill them, as well as adequate financial means, must be made available. To obtain more posts and better financing, PFA's must have clear objectives and well conceived programmes that are justifiable, and well prepared and presented. Good relations of PFA's with other branches of the public administration, good public relations (rating 31), and good communication with decision-making bodies (parliament, congress, national planning bodies, etc.) are also helpful in this respect. A further solution is to improve university- and technical-level education in forestry, attract good students to this field through wide and effective publicity, offer job tenure, good salaries and, above all,

a PFA with a good reputation which it can earn with a convincing forest policy.

In fact, some of the most serious problems are the lack of a well defined forest policy (2), the lack of an accurate definition of the forestry sector (10) and poor relations with other branches of the administration (5). Apart from what has been said already, these three problems, which are closely linked, can have many negative consequences, for if they are not solved, the proper functioning of the PFA is not possible due to conflicts of competence, poor coordination between regional and national plans, insufficient number of posts, inadequate funds, low prestige and lack of authority in dealing with forest owners and industrialists.

What are the reasons behind these problems? Is it the understaffing of the PFA? The shortcomings of forest legislation? The scattering of responsibilities in the field of forestry among government institutions? Or is it a particular stage of development in which the PFA finds itself (e.g. initial phase, recent expansion of tasks, etc.)? Before trying to find the causes outside the PFA it will be necessary to make a thorough, self-critical and objective analysis of the possible internal causes. Once this is done, it will be possible to examine constraints from outside and document their consequences (by making an analysis and a realistic prognosis) for the renewable natural resources, the national economy, foreign trade, regional development, employment, the environment, etc. Such documentation must be transmitted officially to executive and legal authorities, including the Office of the Comptroller. It will certainly be difficult for the PFA to have its memoranda reach the top constitutional authorities. It is therefore advisable to establish an independent institution that is capable of dealing with forest policy matters directly with the highest authorities. The members of such an institution (a national forestry council, for instance) should be appointed by the PFA and by state, community or private associations of forest owners, official forest workers' associations, professional foresters, forestry education and research institutions, etc. There are precedents for such an institution that have actively contributed to determining a clear forest policy.

From FIGURE 50, factors can be grouped under four typical organizational criteria:

- organizational structure;
- personnel administration;
- technical and administrative procedures;
- constraints upon the organization (forest policy and legislation, financial resources, external relations and liaison).

This grouping of data under the main subgroups is presented in FIGURE 51. It has the advantage of pointing up "families" of coherent, interrelated problems.

The problems included under "constraints" (with a total weight of 151 and an average of 3.64 for each problem) are the most serious of all. It is most significant that the subgroup "forest policy and legislation" (total weight 78.5 and average 3.92) is considered the most serious problem, more serious than the problems of external relations (37.5 and 3.57) or the lack of funds (35.0 and 3.18), the latter being of the greatest weight as an individual problem. In reality, the problem of constraints is normally the most difficult one to resolve because its solution requires further fundamental changes that must be accepted by other sectors of the public administration and the national policy. For that reason it has been said that before trying to deal with these external difficulties, it will be necessary to eliminate, in so far as possible, the causes of the said constraints which are actually emanating from the PFA itself.

From the replies received it appears that the two groups of problems which come after "constraints" in order of importance are of similar weight. On the one hand, the group "organizational structure" has a total weight of 77.5 and its component problems an average weight of 3.04, whereas the group "personnel administration" has a somewhat greater total weight (90.0) and its components a lesser average weight (2.74).

Finally, according to the replies, the set of problems "technical and administrative procedures" seems to be less serious (total weight 20.5 and 2.16 average).

FIGURE 51
GROUPING OF PROBLEMS BY ORGANIZATIONAL CRITERIA

Groups of Problems ^{1/}	WEIGHT	Number of times Mentioned	Average Weight
ORGANIZATIONAL STRUCTURE			
<u>Organic Structure</u> 6; 9($\frac{1}{2}$); 13; 15; 19; 34; 37($\frac{1}{2}$)	57.0	17.5	3.26
<u>Management and Direction</u> 9($\frac{1}{2}$); 25($\frac{1}{2}$); 26($\frac{1}{2}$); 28($\frac{1}{2}$); 29; 30($\frac{1}{2}$); 32	20.5	8.0	2.56
TOTAL	77.5	25.5	3.04
PERSONNEL ADMINISTRATION			
<u>Quantitative Capacity</u> 3; 11; 12; 17	53.0	21.0	2.52
<u>Qualitative Capacity</u> 4; 14; 25($\frac{1}{2}$); 28($\frac{1}{2}$); 30($\frac{1}{2}$)	37.0	13.5	2.74
TOTAL	90.0	34.5	2.61
TECHNICAL AND ADMINISTRATIVE PROCEDURES			
21($\frac{1}{2}$); 22; 26($\frac{1}{2}$); 18; 33	20.5	9.5	2.16
TOTAL	20.5	9.5	2.16
CONSTRAINTS UPON THE ORGANIZATION			
<u>Policy and Legislation</u> 2; 10; 21($\frac{1}{2}$); 8; 27($\frac{1}{2}$); 7($\frac{1}{2}$); 16	78.5	20.0	3.92
<u>External Relations</u> 5; 24; 7($\frac{1}{2}$); 31; 20	37.5	10.5	3.57
<u>Financial Resources</u> 1	35.0	11.0	3.18
TOTAL	151.0	41.5	3.64
GRAND TOTAL	339.0	111.0	3.05

Notes: 1/ Specific problems are designated here by their ordinal numbers in the first column of FIGURE 50.

($\frac{1}{2}$) Indicates that the weight of one problem has been equally divided between two groups.

Concurring with the opinion of the persons consulted, we do not believe that the mere fact that numbers have been assigned to the replies permits going beyond the rating of these main sets of problems listed according to their gravity.

2. CONCLUSIONS AND RECOMMENDATIONS

2.1 Situation and Trends

The first conclusion to be drawn from this study is that the forestry institutions of Latin America, and in particular their PFA's, have shown unprecedented dynamism for the last few years. The many institutional measures adopted, the affinity between these measures and the similarity of the reasons behind them make it possible to identify a series of significant trends, which became constantly stronger in the recent past and persist today.

The PFA's of Latin America have now attained different levels of development. Some of them still have little political influence or economic impact, while others have achieved considerable vigour and a great volume of activity. Many of them are in a position to appraise realistically what needs to be done to develop the forestry sector, how this should be done, at what cost and with what repercussions on the economy as a whole. Nevertheless, even the most modern of the PFA's must continue to improve in order to accomplish these tasks. All of them need to develop their field services in order to extend and consolidate their presence in the immense forest zones of the region. In addition, the responsibilities of the PFA's are sure to increase in the future and to change in the light of new concepts and requirements. Therefore, after summing up the main trends in institutional changes, these conclusions include some remarks on problems still pending and on prospects for the next five years.

2.1.1 Trends in forest policy and legislation (of. Chapter II)

- (a) The formulation of forest policy tends to be increasingly dynamic and instrumental. There is a trend towards elaborating these policies in the form of strategic and operational plans for forestry development (FIGURE 35).
- (b) The contents of each forest policy are thus becoming more markedly tailored to the particular needs of the respective country than in past years. However, there is a noticeable general trend towards promoting forest industries and afforestation work and ensuring that forestry development will directly benefit the people living in or near forest areas.
- (c) The policy of development and of a better and more permanent utilization of the potential of forests for the protection of the environment and wildlife and for the promotion of recreation and tourism, as well as the creation of national parks, is gaining strength.
- (d) There is a tendency to increase the areas of public forest land which is under the direct management or effective control of the PFA's, and to ensure that the latter intervene more effectively in delimiting and determining the end use of the land presently under forest which can, and should, be used for purposes other than forestry.
- (e) As far as private holdings are concerned, owners are being guided and stimulated through counselling, economic incentives, technical assistance, information and mandatory control.
- (f) On the whole, social attitudes and behaviour favouring forestry development among the entire population are encouraged through publicity, public relations work and cooperative movement.

- (g) Many basic forest laws and by-laws have been promulgated (FIGURE 5) in which the social function of both public and private forest holdings is recognized. The State tends to translate this function into fact by active measures, although, on the whole, without radically changing the land tenure situation.
- (h) There is a tendency to define more clearly the conditions for granting utilization contracts on public forest land and to increase the control over the execution of these contracts.
- (i) There is a trend towards classifying forest land according to its main use and characteristics in order to graduate the intensity of public control and, whenever warranted, to open certain areas to uses other than forestry.

2.1.2 Trends in forest administration (cf. Chapter III)

FIGURES 5, 9 and 10 reflect the diversity and extent of changes that have occurred in the PFA's of Latin America. These changes have had to do with the rank of the PFA's, the degree of autonomy they enjoy, the manner in which they fit into the overall public administration, and their institutional function and organic structure. They reflect trends towards:

- (a) concentrating primary responsibility for implementation of the forest policy at the national level in one single agency or branch of the public administration;
- (b) converting certain PFA's into semi-autonomous agencies or, in some instances, into corporations (public enterprises);
- (c) broadening the terms of reference of some PFA's by making them agencies for the conservation and development of all renewable natural resources or converting them into the cores of such bodies;
- (d) further integrating some PFA's into the administrative system, incorporating their field services into local or regional public services that have a scope going beyond the forestry field;
- (e) raising the administrative rank of integrated PFA's;
- (f) strengthening the central offices of the PFA's through the establishment or expansion of services for planning and programming, training, public relations and information, research, and organization and methods (O+M).

2.1.3 Trends as regards availability of human resources (cf. Chapter IV)

- (a) Ever greater recognition and application are being given to the idea that well trained staff at all levels is the main motive force of forestry development.
- (b) The number of posts in most PFA's is growing (FIGURE 19). Several of these agencies have in the past decade reached the "critical mass" of technical and managerial staff necessary to undertake ambitious programmes for forestry development. Nevertheless, most of the PFA's still lack a sufficient number of posts in their field services.
- (c) The school systems are graduating more and more professional foresters (FIGURE 18). Whereas demand for such staff seems close to the saturation point in certain countries, most of them still need more professionals in order to develop and exploit their forest resources. On the whole there is a dearth of professionals for forest industries.

- (d) The rate at which intermediate-level forest technicians are being trained has grown, although starting figures were low. Such staff is therefore still scarce, and the ratio of professionals to technicians very high in many countries (FIGURES 19, 20, 24 and 25). There is a shortage of technicians for forest industries practically throughout the region.
- (e) Vocational-level training in forestry has expanded considerably in some countries, but there is still marked understaffing at this level. This insufficiency is the reason why many PFA's fail to take root in the field. Vocational training for forest industries is far from meeting potential demand.
- (f) Many PFA's have evolved on-the-job training systems for their staff. In many cases these are very ambitious programmes that have already reached notable proportions. Some countries have concrete activities or plans for training forest workers in general.

2.1.4 Trends in funding (cf. Chapter V)

- (a) Most PFA's have been fairly successful in getting better allocations of funds. Eight new National Forest Funds were established during the past decade (FIGURE 40). Considering inflation, however, there is no evidence of a high, or at least constant and generalized, rate of increase of funds for PFA's (FIGURE 36).
- (b) Public financing of forestry development has grown considerably in some countries, primarily through tax exemptions for capital invested in afforestation (FIGURE 42) and through the establishment of semi-governmental forestry enterprises. The credit systems, exemptions from land taxes, subsidies and other benefits have also channelled public funds into forestry investments.
- (c) In some countries, forest industries enjoyed strong State financing, sometimes as direct aid, and sometimes indirectly in the form of credit lines, fiscal benefits, facilities for the importing of capital, technology and machinery, customs duty rebates and incentives to increase the value added for export commodities.

2.1.5 Trends in adaptation to change (cf. Chapters VI and VII)

- (a) Many countries have made notable efforts to promote forestry research. The growing cooperation between the PFA's, the academic world and private enterprise in this field is significant.
- (b) The current programmes of forestry research are centred primarily on afforestation (especially with exotic species), silvicultural treatments, and industrial processing of timber (FIGURE 43). The research institutions affiliated to IUFRO increased in number from six to fifteen during the period 1965-1975 (FIGURE 44).
- (c) Many PFA's have improved their systems for compilation of data on forest resources (especially through inventorying) and their units for data and statistics collection and processing. However, the baseline data compilation by the PFA's is still not satisfactory, particularly as regards forest industries and the socio-economic aspects of forestry development.
- (d) The need for improving public relations is recognized by most PFA's in view of the growing interest of the public in forest resources and the necessity of public support for the success of the PFA. Hence the trend towards developing public relations as a permanent, systematic activity.

2.2 Prospects and Recommendations

In view of the dynamism shown by Latin American PFA's, it seems logical to try and envisage their desirable medium-term evolution (up to 1980). Future improvements will presumably tend to: (a) overcome the weaknesses and shortcomings that still persist in the PFA's; and (b) enable them to cope with new developments that seem necessary in view of foreseeable changes in their current responsibilities (cf. Chapter II). Suggestions and recommendations for the future improvement of the PFA's are given in subsections 2.2.1 to 2.2.3 below, taking into account the problems mentioned by the persons interviewed by the authors (see Section 1 of this chapter), in addition to those identified by the authors themselves, which coincide largely with the former (see FIGURES 50 and 51).

2.2.1 Institutional development of PFA's

The efforts being made by most countries of Latin America to strengthen their PFA's prove their conviction that these need to continue to be perfected and strengthened so as to be able to improve their functions and be in a position to confront new circumstances. It is recognized that general development policies will be able to take greater account of the forest resources and their potential contribution as the PFA's grow more mature and their reputation becomes more solid. In turn, the application of general development policies to the forestry sector will be all the more effective the more the operational and promotional capacity of the PFA's increases. It is recommended that in the next few years institutional development efforts be focussed on:

- (a) formulating forest policies that are more deliberately congruent with national socio-economic development policies, which implies constant updating of forest policies at relatively short intervals without interrupting continuity or losing firmness of intention in the long run;
- (b) studying and clearly defining the respective functions and interrelations between the public and the private sectors in the process of forestry development, with the aim of strengthening and diversifying this process and bringing it into line with circumstances in each country;
- (c) assessing, quantifying (if possible) and publicizing the economic, social and ecological benefits that derive or can be derived from the work of the PFA's in order to lay firm foundations for their financing and future strengthening;
- (d) amending forest laws realistically, considering them above all as instruments for: (i) creating and enhancing community behaviour favourable to the aims of forest policies; (ii) concentrating PFA resources in the most pertinent and feasible activities for the implementation of the said policies; and (iii) simplifying and bringing into line the profusion of provisions now in force which govern forest resources in many countries;
- (e) recognizing that planning is a fundamental instrument for forestry development^{1/}: (i) speed up the training of professional foresters in planning concepts and methods; (ii) improve links between planning levels and sectors; (iii) strengthen, or establish if lacking, planning and programming units in PFA's; (iv) pay special attention to the planning of forestry research and to changes in land use, considering the impact of the latter upon the environment; (v) improve cooperation between planners and executive staff of PFA's;

^{1/} This point comprises the conclusions and recommendations of the FAO/SIDA Seminar on Forestry Development Planning (Quito, 1975) that are particularly relevant to the subject of this study.

- (f) in the light of the options chosen with regard to (a) and (b), reviewing the degree of autonomy, the functions, the provision of funds, and the manner in which PFA's fit into the picture of the whole public administration;
- (g) considering also the advisability of restructuring each PFA internally in the light of the relative weight of its responsibilities with regard to supervision, servicing, field operations and work of promotion of forestry development;
- (h) increasing efforts to deconcentrate and decentralize PFA's by strengthening their field offices;
- (i) strengthening the indirect instruments of forest policy, particularly fiscal systems, cooperative arrangements and credit lines.

2.2.2 Adjustment of PFA's to change

- (a) PFA's should redouble their efforts to improve their machinery for adjustment to change, viz: (i) public relations and cooperation; (ii) research; and (iii) information systems.
- (b) In order to frame good programmes for forestry development and get the support which their implementation requires, PFA's must continue to try to improve the whole range of their public relations, including the contacts they maintain with top-level officials, industrial executives, landowners, workers' associations, forest practitioners, educational and research institutions, financiers, lawyers, journalists and the public in general, and, above all, with the rural population. The establishment of National Forestry Boards or National Forestry Commissions, such as already exist in certain countries, can serve a very useful purpose.
- (c) It seems desirable to strengthen the specialized public relations units of the PFA's, or create such where they do not exist. Public relations and information programmes should be based on a study of the views and preferences of the public, and such a study should be subject to evaluation. It is indispensable that the social relations of the PFA's with the rural populations living in or near forest areas be improved.
- (d) Research programmes should be strengthened and fitted better to national requirements. Such programmes should be implemented with the participation of representatives similar to those who assist in framing forest policies. In particular it will be necessary to improve the planning and organization of forestry research, and the formulation and analysis of research projects. Research results should be systematically publicized not only in scientific circles but also among forestry personnel in executive positions. Research is an absolutely essential function of higher schools of forestry, especially if they offer post-graduate courses. Effective cooperation between the PFA, the educational system and the private enterprise in the field of forestry research must be strengthened.
- (e) It seems necessary to strengthen especially research programmes in certain fields: forestry economics, social implications of forestry operations, studies on work improvement, wildlife, etc. Research work should be decentralized to cope with special ecological and socio-economic conditions.
- (f) It also seems necessary for PFA's to establish special units for the purpose of improving, broadening and making better use of their information base (inventories, statistics, etc.). Along with this, any information deemed essential on a permanent basis should be catalogued (for instance, in order

to know how to determine forest policies, development plans, guidelines for management, supplies to the industries, etc.). PFA's should set priorities among such types of information and subsequently evolve programmes for developing their information base, determining the necessary methodologies and know-how.

- (g) Technical, economic and accountancy controls ought to be considered a normal duty of the Heads of field units so as to improve techniques without incurring high expenditures.
- (h) It is also recommended that publications and extension work programmes be strengthened in order to publicize usable know-how through periodicals and bulletins that are accessible to the entire responsible staff. Documentation work jointly with international documentation centres (e.g. AGRIS - Forestry) should be promoted and regional cooperation stimulated by publishing and disseminating forestry journals.

2.2.3 Development of human resources

- (a) All countries should at regular intervals conduct surveys to obtain reliable data on forestry employment opportunities as well as on training and educational needs at all levels. National plans for the development of forestry and forest industries should contain accurate estimates of the manpower necessary for their implementation. Forestry schools and the main employers of forestry personnel (especially PFA's and representatives of the industry) should participate in studies on manpower requirements.
- (b) As part of these studies of sectoral scope, PFA's should prepare prospective plans regarding trends in terms of numbers and qualifications of their staff, in which special attention should be paid to the strengthening of field offices.
- (c) In the light of the studies mentioned under (a) and (b) above, it is advisable to establish in each country, after consultation with forestry workers and students, overall programmes for advanced training of forestry staff based on the concept of continuing education.
- (d) Better coordination of educational work, especially of post-graduate education, in the region needs to be secured.
- (e) There is also an urgent need for a systematic study of the employment capacity of the forestry sector and its expansion possibilities, translating requirements into actual offers of employment. Special attention must be paid to providing permanent employment for forest workers, to employment of women, to safety and hygiene on the job, and to the cultural and social advancement of workers.
- (f) Forestry education should attach more importance to the aspects of processing, industrialization and marketing of forest products so as to be able to supply forest industries with trained and qualified staff at all levels.
- (g) Insufficient weight is being given in the field of forestry education to the social sciences, and to managerial aspects in industry and in the public administration. This shortcoming must be overcome through systems of continuing education and training and by offering post-graduate courses in administration, organisation and sociology as applied to forestry.

- (h) Great preference must continue to be given to the training of intermediate-level forest technicians. Thought should also be given to structural changes that will reduce the need for such manpower: strengthening of vocational education, compulsory field work assignments of a certain duration for young professionals, and greater practical work content in higher education.
- (i) Finally, vocational training in forestry operations and forest industries merits top priority. Such training should aim at attaining the goals - both numerical and qualitative - arising out of specific plans for afforestation, forest management, forest utilization and industrial processing of forest products.

COMPARATIVE STUDY
OF PUBLIC FORESTRY ADMINISTRATIONS IN LATIN AMERICA

NATIONAL QUESTIONNAIRE

Country

- Notes: (a) The answers to this questionnaire will be the prime source of information for FAO's Forestry Department in its preparation of a comparative study of public administrations and services for forestry development in Latin America. Please be as specific as possible in your answers. However, if any question does not fit the conditions in your country or if the requested information is not available to you, please say so or draft your answer as you see fit. We will also appreciate your enclosing with the filled-in questionnaire material (publications, statistical data, charts) that will amplify or improve the information requested.
- (b) The most important questions are those that are boxed in, and you may confine yourself to them. However, we would greatly appreciate your answering the other questions as well, if only partially.

1. Forestry development policy and plans

Please:

- 1.1 Describe how the "forestry sector" is defined in your country from the standpoint of public administration (for example: does it include forest industries?, the trade in forest products?, national parks?, wildlife management?, environmental protection?).
- 1.2 Describe the broad outlines of your country's forestry policy and its relations to general land-use policy. State whether the forestry policy was formulated explicitly and officially and how: in a presidential declaration, in the preamble or purview of a law, etc.
- 1.3 State whether any specific plan or plans for forestry development are in effect. If so, state briefly: the periods covered, the primary objectives, and total investments provided. State whether, in addition to technical and economic goals, the plan includes goals of administrative, legislative or educational improvement such as: the creation of a programming unit, the organization of an in-service personnel training system, amendments to forestry legislation and regulations, etc.
- 1.4 State whether there is a general plan for national socio-economic development. If so, state the period covered, the principal objectives, total investments provided and how the development plan for the forestry sector fits into it.

- 1.5 Describe briefly the methodology used in formulating plans and policies for forestry development. By which public administration agency was the plan prepared?

2. Legal and normative base of forestry development

Please:

2.1 List, by title and date of enactment alone, the codes, laws, regulations and other comparable provisions deemed of considerable importance as a legal and normative base of forestry development in a broad sense (that is, including watershed management, national parks, wildlife, forest industries and the marketing of forest products). Please also take account of provisions not relating exclusively to forestry which considerably affect the forestry sector.

2.2 Describe the present situation and tendencies in relation to the ownership of forest lands. Include figures if possible (percentage of (a) national forest lands, (b) forest lands owned by public bodies such as communities, municipalities and provinces, and (c) privately-owned forest lands).

2.3 Summarize the principal features of the legal and contractual base for the utilization of public (national and other) forests. If such utilization is subcontracted to private enterprises to a considerable extent, briefly state: the total area so allocated in the country; the usual duration of contracts; how the public forestry administration controls the performance of these contracts, and what part it plays in awarding them.

2.4 Indicate the principal criteria for government intervention to regulate and promote private forestry activities, particularly in regard to reforestation (the policy on associations and cooperatives, taxes, credit, subsidies, insurance, technical assistance, marketing, information and extension, and infrastructural development).

2.5 Describe briefly the legal and administrative basis for the promotion of forest industries, particularly as they relate to economic development, employment, personnel training, and environmental protection.

2.6 Describe briefly the policy and legal basis for the exportation and importation of forest products. State whether legislation exists to favour the industrial processing of forest raw materials within the country. Describe the repercussions of free-trade zones, commercial treaties or other international agreements, if any.

3. Descriptive analysis of the public forestry administration

Please give pertinent information on:

- 3.1 Institutional status. The administrative rank, and formal functions and powers of the PFA (relations to information supplied in boxes 1 and 2).

3.2 Performance

3.2.1 Principal quantifiable operations in 1973* (ha. reforested, nursery plants produced, area protected against fire, area under management and under control, etc.).

3.2.2 Principal operations unquantifiable or difficult to quantify carried out in 1973 (new regulations, improvements in the organization, collection and processing of data, in personnel training, etc.).

3.2.3 Date of establishment of the PFA; brief account of the development and evolution of the PFA.

3.3 Interactions

Please:

3.3.1 Enumerate the principal agencies of public administration, para-governmental bodies, autonomous public institutions, associations, etc. that play an important part in forestry development.

3.3.2 Describe the principal interactions (collaboration, coordination, etc.) of the PFA with institutions, administrative agencies and organizations in and out of the public administration system such as those mentioned in 3.3.1 (for example: with teaching and research centres, autonomous agencies, associations of members of a profession, of owners, of entrepreneurs, or of peasants).

3.4 Internal structure

3.4.1 Please supply an organizational chart of the PFA.

3.4.2 Please indicate which units or persons in the PFA have charge of the following functions:

- (a) Planning and programming
(for example: "in the PFA there is a Programming Office under the direct supervision of the General Director");
- (b) drawing up the budget
(who prepares it, when, how);
- (c) improvement of organization and methods
(for example: "there is no organization and methods unit in the PFA, but rules are handed down by the existing Organization and Methods Office of the Ministry of Agriculture as a whole");

* or in the nearest year for which adequate data are available.

- (d) evaluation and control of operations;
- (e) personnel administration;
- (f) in-service personnel training.

Please state the number of upper-level staff (professional foresters, licentiates, engineers and others of comparable level) working in: (a) headquarters units and (b) field posts. Please indicate whether there are provincial or state services distinct from the national PFA and, if there are such, their relations with the latter.

3.5 Operation

Please:

3.5.1 Convey the degree of centralization of the PFA. Indicate, for example, who can take each of the following decisions (without consulting higher authority):

- (a) approve a management plan for 5,000 ha. of public forest land;
- (b) hire 50 workers for reforestation work;
- (c) buy 10 sacks of fertilizer for a tree nursery;
- (d) issue a permit to cut 10 m³ on public lands;
- (e) authorize a service trip by a forestry expert in a service vehicle for three days.

3.5.2 Describe simply how internal communications operate in the PFA. For example: approximately how many circulars, memoranda, letters, communications, etc., are generated each year in the headquarter's units? Are there technical and procedural manuals at the disposal of the staff? What use is made of the telephone and of radio communication? Are staff meetings held (occasionally, regularly)?

3.6 Personnel

Please:

3.6.1 Fill out Table 1 and, if possible, Table 2 as context. (See Appendix)

3.6.2 Indicate whether there are official descriptions of powers, responsibilities and qualifications: (a) for each post in the PFA and (b) for some posts.

3.6.3 Give, if possible, sample descriptions for (a) a high-level technical post, (b) an intermediate-level technical post, (c) a forest ranger post.

3.6.4 State the special features - if any - of the personnel policy applied in the PFA in the context of the policy applied in public administration in general (salaries, personnel selection criteria, etc.).

3.6.5 State how much manpower (man-days worked by forest workers) was employed directly by the PFA in 1973*. Describe (no figures required) the trend (increase, decrease) in the direct employment of forest workers in the PFA since 1 January 1969.

3.6.6 Describe the functions and activities in the training of (a) new staff and (b) in-service staff in the PFA at all levels (exclude activities of faculties and schools not connected with the PFA but include cooperation by the PFA with those institutions).

3.7 Long-term adjustment mechanisms

Please:

3.7.1 Describe the PFA's machinery for public relations and for informing the population at large.

3.7.2 Describe the PFA's research activities in the broad sense (for example: activities for learning more about the forest resources, forest products, the socio-economic context, the techniques and technologies best suited to the country's forest resources).

3.7.3 Indicate the existing plans or intentions for improving the skills, motivations and remuneration of the personnel; for improving the functional effectiveness of the PFA; for making its objectives and performance increasingly responsive to the socio-economic requirements of the country.

3.8 Inputs, material and financing

Please:

3.8.1 State as accurately as possible in figures (in ha.):

- (a) The area of public forest land in the country;
- (b) the area of public forest land administered directly by the PFA;
- (c) the area of public forest land that the PFA controls under utilization contracts;
- (d) the area of public forest lands for the general protection of which the PFA is in some way responsible;
- (e) the area of privately-owned forest land in respect of which the PFA is responsible in some way for
 - i) protection
 - ii) the application of government control standards.

3.8.2 Indicate the general financing machinery (forestry fund, etc.) and the total funds available to the PFA for investments in 1973.

3.8.3 Indicate the recurrent funds (ordinary operating and maintenance expenses) available to the PFA in 1973.

* or in the nearest year for which adequate data are available.

3.8.4 Describe briefly the principal plant and equipment of the PFA (buildings, installations, vehicles, instruments, etc.).

4. Other aspects of the forestry institutional framework

4.1 Which, in your view, are the principal organizational/administrative problems confronting the PFA? To what extent are those problems peculiar to the PFA and how do they relate to those of the public administration as a whole?

4.2 If, in your view, there are important features of the PFA and other institutions relating to forestry development in your country that could not be described under headings 1, 2 and 3, please describe them here.

APPENDIX

TABLE 1

Employment in the Public Forestry Administration
(on 1 January 1974) *

Functions	Number of persons employed						
	With university training (Engineers, etc.)		With intermediate-level technical training or equivalent (Technicians, etc.)		With vocational training (Forest guards, etc.)		With no specific training
	Forestry	Other	Forestry	Other	Forestry	Other	
Managerial and executive**							
Planning, programming							
Research							
Personnel training, public information							
Processing, secretarial							
Field forestry operations ***							
Forest guards							
Others (specify)							
TOTALS							

* or on the date closest to 1/1/74 for which this information is available.

** Professional and technical staff normally working in the capital of the country or in provincial capitals and giving more than 50 percent of their time to the supervision, organization, coordination or evaluation of the work of others.

*** Personnel of any level giving more than 50 percent of their time to field work.

TABLE 2

Estimated Employment in the Forestry Sector

(on 1 January 1974) *

Subsector	Number of persons employed						
	With university training (Engineers, etc.)		With intermediate-level technical training or equivalent (Technicians, etc.)		With vocational training (Forest guards, etc.)		With no specific training
	Forestry	Other	Forestry	Other	Forestry	Other	
Public forestry administration							
Forestry education and research **							
Private forest activities							
Forest industries							
Forest trade							
Others (specify)							
TOTALS							

* or on the date closest to 1/1/74 for which this information is available.

** Excluding persons enumerated in Table 1 because they belong to the PFA.

ANNEX II

REFERENCES TO LATIN AMERICAN COUNTRIES IN THIS STUDY

ARGENTINA

Pages Nos.: 11, 14, 17, 20, 21, 22, 25, 26, 27, 31, 38, 39, 41, 45, 48, 55, 61, 62, 63, 65, 67, 82, 99, 107, 111, 113, 119, 120, 121, 126, 129.

Figures Nos.: 2, 3, 4, 5, 9, 10, 18, 35, 36, 39, 40, 44.

BELIZE

Pages Nos.: 14, 16, 22, 77, 81, 128.

Figures Nos.: 2, 3, 4, 9, 19, 20, 29, 35, 36, 39.

BOLIVIA

Pages Nos.: 14, 15, 20, 22, 23, 25, 38, 42, 45, 61, 67, 73, 80, 107, 119, 141.

Figures Nos.: 2, 3, 4, 5, 9, 10, 18, 19, 29, 36, 39, 40, 41.

BRAZIL

Pages Nos.: 2, 11, 17, 20, 21, 22, 23, 25, 26, 27, 31, 39, 61, 62, 65, 66, 67, 73, 80, 82, 91, 112, 116, 119, 120, 121, 122, 126, 129.

Figures Nos.: 2, 3, 4, 5, 9, 10, 18, 19, 42, 44.

CHILE

Pages Nos.: 2, 20, 22, 27, 28, 31, 38, 40, 41, 42, 45, 46, 61, 62, 63, 65, 66, 70, 77, 78, 82, 83, 91, 95, 99, 111, 113, 116, 119, 120, 121, 122, 126, 128, 129, 130.

Figures Nos.: 2, 3, 4, 5, 9, 10, 13, 18, 19, 26, 27, 28, 35, 36, 39, 44.

COLOMBIA

Pages Nos.: 11, 15, 17, 20, 21, 22, 23, 25, 27, 31, 38, 39, 41, 42, 45, 61, 62, 63, 65, 66, 67, 73, 75, 77, 82, 83, 94, 97, 98, 99, 113, 119, 120, 121, 122, 128, 129, 140, 141.

Figures Nos.: 2, 3, 4, 5, 8, 9, 10, 18, 19, 20, 26, 29, 34, 35, 36, 39, 44.

COSTA RICA

Pages Nos.: 14, 15, 16, 17, 23, 25, 26, 39, 41, 61, 70, 76, 107, 111, 116, 119, 120, 128.

Figures Nos.: 2, 3, 4, 5, 9, 19, 20, 35, 36, 39, 40, 44.

CUBA

Pages Nos.: 17, 41, 61, 62, 80, 120, 126, 128.

Figures Nos.: 2, 3, 4, 5, 9, 10, 35, 44.

DOMINICAN REPUBLIC

Pages Nos.: 14, 61, 111.

Figures Nos.: 2, 3, 4, 9.

ECUADOR

Pages Nos.: 10, 11, 15, 17, 23, 28, 31, 34, 38, 40, 61, 66, 70, 76, 82, 94, 107, 113, 119, 120, 122, 126, 128, 140, 141.

Figures Nos.: 2, 3, 4, 5, 8, 9, 18, 19, 20, 29, 35, 36, 40.

EL SALVADOR

Pages Nos.: 6, 14, 15, 17, 20, 22, 25, 39, 40, 41, 42, 45, 76, 77, 104, 113, 119.

Figures Nos.: 2, 3, 4, 5, 9, 19, 20, 29, 35, 36, 39.

GUATEMALA

Pages Nos.: 14, 16, 17, 20, 25, 26, 34, 39, 45, 61, 67, 70, 82, 107, 121, 122, 141.

Figures Nos.: 2, 3, 4, 5, 9, 10, 19, 35, 36, 40.

GUYANA

Pages Nos.: 15, 16, 17, 22, 39, 70, 71, 113, 119, 122, 126, 128, 129, 141.

Figures Nos.: 2, 3, 4, 5, 9, 18, 19, 20, 29, 35, 36, 39.

Pages Nos.: 6, 17, 107.

Figures Nos.: 2, 3, 4, 5, 8, 9, 40.

Pages Nos.: 10, 14, 15, 16, 17, 20, 22, 23, 25, 26, 31, 38, 39, 40, 42, 45, 61, 62, 66, 68, 70, 73, 82, 83, 86, 104, 111, 122, 126.

Figures Nos.: 2, 3, 4, 5, 9, 10, 12, 19, 35, 36.

JAMAICA

Pages Nos.: 6, 16, 17, 41, 45, 70, 71, 77, 81, 121, 126, 128, 129, 130.

Figures Nos.: 2, 3, 4, 9, 19, 20, 29, 36, 39.

CO

Pages Nos.: 2, 10, 11, 14, 15, 16, 17, 20, 21, 22, 25, 26, 27, 28, 31, 38, 39, 41, 61, 62, 63, 66, 67, 70, 73, 77, 78, 80, 99, 107, 111, 113, 116, 119, 120, 121, 122, 126, 128, 140, 141.

Figures Nos.: 2, 3, 4, 5, 9, 18, 19, 35, 36, 39, 40, 44, 49.

NICARAGUA

Pages Nos.: 17, 34, 41, 73, 120.

Figures Nos.: 2, 3, 4, 5, 9, 19, 20, 29, 35, 36.

PANAMA

Pages Nos.: 14, 15, 17, 25, 26, 107, 122.

Figures Nos.: 2, 3, 4, 5, 9, 40.

PARAGUAY

Pages Nos.: 10, 14, 15, 17, 19, 20, 22, 25, 31, 34, 39, 41, 42, 80, 82, 107, 119, 122, 129, 141.

Figures Nos.: 2, 3, 4, 5, 7, 9, 18, 19, 20, 29, 35, 39, 40, 44.

PERU

Pages Nos.: 10, 11, 15, 16, 17, 20, 22, 23, 26, 27, 28, 31, 38, 41, 42, 48, 61, 63, 76, 80, 83, 94, 99, 104, 119, 120, 121, 122, 128, 140, 141.

Figures Nos.: 2, 3, 4, 5, 8, 9, 11, 18, 26, 35, 36.

SURINAM

Pages Nos.: 23, 41, 111, 119, 121, 128.

Figures Nos.: 2, 3, 4, 8, 9, 18.

TRINIDAD

Pages Nos.: 6, 61.

Figures Nos.: 2, 3, 4, 9, 44.

URUGUAY

Pages Nos.: 15, 20, 22, 38, 40, 61, 63, 66, 82, 107, 111.

Figures Nos.: 2, 3, 4, 5, 9, 18, 19, 20, 29, 35, 36, 39, 40.

VENEZUELA

Pages Nos.: 10, 14, 15, 16, 17, 20, 27, 34, 39, 41, 61, 62, 63, 67, 80, 83, 116, 119, 122, 126.

Figures Nos.: 2, 3, 4, 5, 9, 18, 44.

ANNEX III

SEMINAR ON MODERNIZATION OF PUBLIC FORESTRY ADMINISTRATION
IN THE FORESTRY SECTOR OF LATIN AMERICA

Lima, Peru, 10 - 29 November 1975

CONCLUSIONS AND RECOMMENDATIONS

I. FOREST POLICY

The rational use of the natural resources implies the formulation of a forest resource development policy which aims at the optimum utilization of these resources for the benefit of man. It is therefore necessary to create for the development of forest resources an efficient, specialized agency^{1/}, or to strengthen the existing one, which proposes, lays down and implements the forest policy of the State.

The Formulation of a Forest Policy

The minimum background information which is necessary to formulate a forest policy consists of the following:

- (a) Survey and present use of the forest resource;
- (b) Determination of the sphere in which the policy is applied;
- (c) Current and potential contribution of the forest resource to the country's economy;
- (d) Impact of the natural resources on the environment and on the quality of human life.

Ways of Enunciating a Forest Policy

The countries of this region have various ways of enunciating their policies:

- (a) in development plans;
- (b) in presidential declarations;
- (c) in laws;
- (d) in concrete activities.

Specific Goals

Within the priorities set by each country in the light of existing conditions, the following specific goals may be determined:

- Maintaining national sovereignty over the natural resources;
- Building up a public forest domain;
- Increasing the quantity and quality of forest products in harmony with the ecology by placing the forests under management plans with a view to obtaining a sustained yield;

1/ Hereinafter called "Public Forestry Administration" (PFA).

- Enhancing the social usefulness of the forest by involving the local population in its use;
- Regulating the marketing of forest products with respect to quality, quantity and price;
- Fostering the conservation of the environment by including the relevant measures to be taken in the management plans;
- Ensuring the proper management of watersheds to stabilize the water regime and regulate water use;
- Ensuring protection and management of flora and wildlife in order to maintain the natural ecological equilibrium;
- Raising public consciousness of the forests and gaining public support for forestry work through education, publicity and extension programmes;
- Ensuring a harmonious management of the natural resources by establishing close collaboration between agencies in charge of the administration of these resources.

In order to achieve these objectives, it is recommended to:

- Make forestry activities an integral part of the country's socio-economic development, aiming at increasing the national income through development of the forestry sector and proper forest administration;
- Organize and fund PFA's sufficiently to achieve an adequate and timely execution of their programmes;
- Provide or strengthen indirect forest policy instruments, particularly through fiscal incentives and cooperative and credit schemes;
- Examine and clearly define the respective functions and interrelations of the public and private sector in the process of forest development, so as to strengthen and diversify this process as warranted by conditions prevailing in a particular country;
- Establish forest industries in line with the forest potential;
- Make plans for the establishment and management of national parks and similar areas;
- Organize and develop campaigns and programmes for the prevention and combat of forest fires as well as for pest control;
- Seek permanent sources for employment in forest zones;
- Foster national and international technical assistance in forestry;
- Organize and develop research programmes in accordance with national requirements with the help of representative authorities similar to those who define forest policies. In particular, the planning and organization of forestry research, as well as the formulation and analysis of research projects, should be improved;
- Ensure a systematic diffusion of research findings not only in scientific circles but also among executives in the field of forestry; strengthen the cooperation in forestry research between the PFA, the educational system and private enterprises, and decentralize research activities according to ecological and socio-economic conditions.

II. FOREST LAWS

From the statements and discussions of the Seminar participants it became evident that there was a need for revising and amending existing legal instruments in order to achieve their correct implementation.

Legal Trends

It was noted that present legal trends are as follows:

1. Trends pertaining to the management of the forest resource:
 - (a) Special laws;
 - (b) Semi-integrated laws;
 - (c) Integrated laws.
2. Trends as regards the place of the PFA in the overall system of public administration:
 - (a) Autonomous PFA;
 - (b) Semi-integrated PFA;
 - (c) Integrated PFA.
3. Trends as regards the utilization of forest resources:
 - (a) Contracts to private enterprises, associations, government agencies;
 - (b) Direct management by the State.

Since legislation should take into consideration the needs, aspirations and aims of the countries in the region, it is recommended that:

- Countries adopt, strengthen or improve their legal instruments to achieve an optimum development of their forest resources in line with their policies;
- Legal instruments be adjusted to local conditions in order to make them applicable to, and effective in, the management of natural resources;
- Laws governing natural resources effectively secure the conservation, proper management and complete utilization of these resources.

III. PLANNING

Planning is a prerequisite in the operational work of the PFA. Accordingly, in the light of the conclusions of the FAO/SIDA Seminar on Forestry Development Planning (Quito, 1975), it is recommended that:

- PFA's be endowed with manpower and resources which allow them to: (a) be integrated in the national planning system, and (b) organize their institutional work in line with well formulated programmes and projects;

Planning programmes be aligned with the objectives and targets of administrative reform;

Management plans be prepared as basic components of regional and sectoral plans in order to: (a) standardize methods for their preparation; (b) develop the system of basic inventories as part of the statistical system of the forestry sector; (c) improve the control over the execution of management plans; and (d) promote the exchange of information between PFA's.

- Countries include programmes for specialization in their development plans in order to train forestry staff at all levels.

IV. ORGANIZATION

The Concept of "Forestry Sector"

From the standpoint of the PFA, the term "forestry sector" covers in most Latin American countries all activities pertaining to the administration, management and utilization of forests and forested lands. It also covers other aspects such as conservation of the environment and wildlife, national park administration, development of forest industries, domestic and foreign trade in forest products, and especially the functions of planning, research, training and development.

The Field of Activity of Public Forestry Administrations

Since PFA's are public services, they reflect the State's political approaches, that is to say, they evolve and operate in accordance with the development goals set by each government. It is up to the State to determine the field of activities of its forest administration according to its political philosophy.

In this respect it is recommended that:

- The State's forest policy be executed by a single agency which, for reasons of public interest, protects the forest and manages it for the purpose of socio-economic development, safeguarding its continuity through rational utilization;
- The State assume responsibility for the rational utilization of its forest resources by setting up concrete standards for policy implementation.

Structure and Hierarchical Level

The organizational structure will depend on the field of activities of the Forest Administration according to the responsibilities vested in it by the State.

In this connection it is recommended that:

- PFA's be endowed with means commensurate to the economic and social importance of the forest resources to facilitate their administration and management;
- PFA's, in order to fulfil their functions, be accorded an appropriate hierarchical rank to be able to make their decisions with sufficient authority;
- PFA's, in addition to maintaining an appropriate central structure, lay special emphasis on strengthening their territorial structures and field operations to be able to execute the forest policy;
- PFA's be sufficiently autonomous to be able to fulfil their responsibilities towards the sector in relation to the country's socio-economic development.

Financing

The work of the PFA's has certain specific features that makes it necessary for them to be granted preferential treatment in the allocation of financial resources. Within the limits of budgetary laws, governments are urged to let their Forest Services administer and manage forestry funds independently, in order to carry out the operational programmes for the sector. Accordingly, it is recommended that:

- Adequate budgetary allocations be made for forestry administrations so that they may fulfil their functions according to the importance of the sector and its potential contribution to national plans;
- The budget item "operational costs" be properly balanced against the item "personal services" in view of the special nature of forestry administrations;
- Greater financial means be made available for technical training programmes at all levels;
- Forestry administrations, when allocating expenditure from National Forest Funds, accord priority to operational programmes;
- Additional sources for financing be found for the development of programmes in the forestry sector.

Relationships

Since PFA's form a part of the overall system of public administration, close liaison with other components of the system is essential. It is therefore recommended that:

- PFA's clearly state their terms of reference so as to ensure full cooperation with the entire public administration system and the necessary support for their operations;
- An operational system be established within the PFA's in which the phases of planning, execution and evaluation may be well coordinated.

V. MANPOWER RESOURCES

The proper definition and implementation of forest policy depends on manpower resources availability.

Formal education provides the necessary training for personnel to carry out planning, normative, executive and control functions in the forestry sector. Public education, which uses all kinds of communication media, helps to arouse community interest in forestry matters. In-service training is a continuing and important responsibility of the PFA's, jointly with educational institutions.

Since the forest resources play such an important role in socio-economic development, all graduates from forestry schools and related educational institutions should act as agents for social change and be capable of demonstrating to the community how important the forests are in their functions of nature protection, production of goods, and satisfaction of social needs.

The manpower problems of the PFA's vary considerably, depending on whether the respective countries possess complete or semi-complete or minimal forestry education and training systems. In many countries, the demand for forestry personnel justifies only a partial forestry training system, but such a partial system should at least provide for (a) continuing training of the serving personnel; (b) quantitative and qualitative assessment of future requirements for personnel at all levels; (c) programming and promotion of staff training partly within the system and partly abroad; and (d) public information and education.

Shortage of Professional Staff

In virtually all Latin American countries there is a marked dearth of professional foresters, so that the requirements of the PFA's and of the forestry sector as a whole cannot be met. This shortage is more keenly felt in the early stages of setting up or reorganizing a forest service. Certain countries have no forestry faculty of their own, while other countries do have such facilities and even post-graduate schools. Most countries which have no

forestry faculties do have faculties of agriculture where many basic subjects of the forestry curriculum are taught, and in some countries the shortage of professionals is becoming critical, although there is no justification for setting up a higher-level forestry school. It is therefore recommended that:

- Countries which do have forestry schools assist those that do not in training their students by way of curricula leading to the obtention of academic degrees and titles, and that the former countries also organize short special training courses to meet the needs of the latter;
- Certain countries which have no practical possibility for training foresters, offer courses in forest sciences in the faculties of agriculture for the last two study years;
- Programmes for specialization in forestry sciences be introduced in post-graduate schools for the benefit of agriculturists and professionals in other fields by granting full-coverage scholarships.

In particular, in view of the present situation in Central America with regard to the training of foresters, and in compliance with the wishes expressed by the participants from Central American countries, it is recommended that:

- FAO sponsor, with the support of the interested countries, a specific study and meeting to review the situation and look into the possibility of setting up a project for higher forestry education in the Central American sub-region.

Shortage of Technical Staff at Intermediate Level

The shortage of intermediate-level forestry staff, in the public as well as in the private sector, is becoming critical in most Latin American countries in spite of the fact that several new schools have been established. It is recommended that:

- Technical forestry schools in countries endowed with a great economic potential turn to training personnel in specific areas of forestry and forest industries;
- Countries with limited forest resources make every effort to establish schools to meet the technical manpower requirements of particular groups of countries;
- Central American countries support the Escuela de Ciencias Forestales of Siguatepeque by sending students there on fellowships and by providing facilities for practical study in different areas.

Shortage of Vocationally-Trained Personnel *

There is a very great demand for vocationally-trained manpower, although it is difficult to establish exact figures. Since most PFA's of Latin America provide training courses at vocational level, usually for their own staff, it is recommended that:

- Such courses be expanded and be held at regular intervals;
- The above activity be extended to vocational personnel in private enterprises and that the latter collaborate in this matter;
- Vocational training in forestry operations and forest industries be given the high priority it deserves and aim at quantitative and qualitative targets derived from actual afforestation, management, and utilization plans.

Vocationally-trained personnel are forest guards, park wardens, topographer assistants, skilled workers, foremen in nurseries, plantations and forest operations, mechanics and equipment operators, etc.

Inadequate Manpower Training

The Comparative Study of Public Forestry Administrations in the Forestry Sector of Latin America reveals that inadequate manpower training is considered to be a very serious handicap. Since the problem is partly due to the fact that forestry education is not always oriented towards meeting the practical needs of the PFA's, it is recommended that:

- PFA's in all countries maintain close liaison with educational institutions, solicit the inclusion in their curricula of subjects which are of interest to them, and collaborate with these institutions in assessing the practical results of training;
- Experienced professionals of the PFA's collaborate in educational work whenever necessary;
- PFA's request the collaboration of the forestry schools in order to organize and conduct special courses for their staff;
- Professional forestry schools include in their syllabuses or give more emphasis in them to specific subjects pertaining to forest administration;
- Post-graduate forestry programmes include the training of specialists in public forestry administration and management of forestry enterprises;
- PFA's organize, in collaboration with forestry schools, special courses for the training of instructors to teach in technical and vocational schools;
- PFA's produce, in collaboration with professional schools, textbooks and manuals for the use of teaching staff, especially for vocational courses.

Overconcentration of Staff and Insufficient Independence in Decision-Making

There should be balanced deployment of staff with regard to its location, nature of work and the numerical ratios between staff at different levels.

Overconcentration of staff at headquarters has a negative effect on forestry development. It makes the delegation of responsibilities difficult and thus hinders staff participation in decision-making. From this it can be deduced that decentralization is necessary for a more efficient administration and for better relationships with the community.

Most of the upper-level staff in Latin America is carrying out managerial and executive work, is in charge of planning and programming and, to a minor extent, also research work, while a small proportion is doing field work or is engaged in training activities. Although the latter two functions are largely the responsibility of technical personnel at intermediate level, upper-level staff must devote itself to such tasks a great deal more than is the case at present.

In almost all Latin American countries, the staffing pyramid in the PFA's has too narrow a base due to a relatively greater shortage of technical- and vocational-level staff. PFA's should therefore lay greater emphasis on employing personnel at these lower levels.

Poor Internal Communication

The officials of many PFA's have no knowledge of what is going on in the various branches, and human relations within the agencies are rather poor. It is therefore recommended that:

- Regular meetings at different levels be held with technical personnel working in the various offices of the PFA, in order to discuss past and future programmes and work plans, and exchange ideas so that all may become familiar with the work done by each branch;

- The activities of the different units be coordinated in order to avoid duplication of work and improve collaboration and mutual understanding;
- Information bulletins on various aspects of importance to the agency be published and disseminated periodically;
- Public relations work be increased and informative material distributed not only to the public but also to the PFA's own personnel at all levels.
- Publications and technical material be made available to all staff, and especially to staff members in the field. It would be useful to have a central library and a bibliographic bulletin, and to establish a system for the use and circulation of all available material;
- Human relationships be improved among all staff through informal meetings (sports activities, social gatherings, trips to the field, etc.).

Incentives for Staff and Job Tenure

The insufficient incentives offered by the PFA's make it difficult to attract and keep the necessary personnel or to inspire enough interest among young students to opt for forestry careers. It is recommended to:

- Revise, whenever necessary, the salary scales of PFA's to ensure that salary payments are not lower than those offered by other sectors of the Public Administration for similar posts;
- Pay supplements in recognition of work conditions which, in general, are harsher in the PFA's than in any other branches of the Administration;
- Establish a fund for subsidies or low-interest loans for fellowship holders in order to solve their financial problems in view of the low stipends they receive. The fellowship holder who returns to his country should be offered a job in keeping with his training and should commit himself to render services to the State for a minimum period of time in return for the fellowship he received;
- Ensure that officials of the PFA enjoy stability of employment in jobs where functions and duties are clearly defined.

In addition to economic incentives there are other incentives that PFA's should try to make known in order to attract more professionals to the forestry career: (i) opportunities in the forestry sector to develop the individual's initiative as well as his desire to serve the community; (ii) contact with nature; (iii) the vast range of activities that can be developed; (iv) research facilities and opportunities.

Employment in the Forestry Sector

Since PFA's, apart from training their own staff, should make every effort to increase the availability of specific jobs in both the public and private sectors, it is recommended that:

- All countries make regular surveys to collect reliable data on employment opportunities in forestry and on training requirements at all levels;
- National plans for forestry and forest industries development contain accurate assessments of staff necessary for their implementation;
- Forestry educational centres and the main employers of forest manpower (particularly the PFA's and industry representatives) participate in surveys of manpower requirements;

- Forestry educational institutions pay greater attention than hitherto to aspects related to the utilization, processing and marketing of forest products to be able to supply forest industries with trained staff at all levels.

VI. SUPPORT OF INTERNATIONAL AGENCIES

The Seminar endorses the concerns and conclusions expressed in the document prepared by the participants in the Round Table on Forestry Education in Latin America, held during the Seventh World Forestry Congress (Buenos Aires, Argentina, 1972) and recommends:

- that all international agencies concerned with the development of Latin America (UNDP, FAO, OAS, IDB, AID, SIDA, CIDA, etc.) assign high priority in their programmes of work to the implementation of the above recommendations.

In this connection, the Seminar is of the opinion that forestry projects may be identified at national level, national level with a regional projection, and regional level.

EXCERPT FROM THE REPORT OF THE 12TH SESSION OF
THE LATIN AMERICAN FORESTRY COMMISSION

(Havana, Cuba, 2-7 February 1976)

MODERNIZATION OF PUBLIC ADMINISTRATION IN THE FORESTRY SECTOR IN LATIN AMERICA

39. The Commission considered document FO:LAFC/76/4, "Modernization of Public Administration in the Forestry Sector in Latin America", together with supporting document FO:MISC/75/22, "Comparative Study of Latin American Public Forestry Administrations" (draft version). Many countries joined in the discussion and contributed information on their major problems and accomplishments in institutional development in the forestry field. The discussion clearly conveyed how dynamically many Latin American public forestry administrations were acting to improve the performance of their present tasks and cope with new circumstances.

40. The following conclusions emerged from the discussion:

- Forest policy should faithfully translate in the forestry sector the general socio-economic guidelines of the country.
- The public forestry administration is the principal instrument for implementation of the government's forest policy. Hence the public forestry administration should be placed on a level of authority consistent with the present and potential importance of the forestry sector.
- The public forestry administration should be so organized as to strengthen and decentralize the territorial structures with a view to operational efficiency, while leaving the principle of normative centralization intact, and the activities of the forest service should be integrated with those of the other public services in order to harmonize the various uses of land and contribute to rural development.
- In addition to the public forestry administration it is necessary to reinforce the indirect instruments of forest policy, particularly taxation, cooperation and credit.
- A staff well trained at all levels and actuated by the idea of service for the public good is the principal engine of forest development.

41. The Commission recommended:

- (a) that forest plans be straightforward and practical, and an integral part of the national socio-economic development plans;
- (b) that the member countries augment their exchanges of information and share as fully as possible their experiences in forest development through meetings, working groups and other arrangements; it recommended in particular that working groups be set up on:
 - (i) forest administration
 - (ii) organizational patterns for forest production
 - (iii) the development of commercial forest plantations
 - (iv) the development of pulp and paper industries, with special attention to medium-sized plants;

- (c) that the member countries and FAO make an effort to establish a regional-level project for studying the possibilities and problems of agro-silvi-pastoral management in Latin America and promote the rational utilization of renewable natural resources through a balanced combination of their various uses;
- (d) that the interchange of forest seed be intensified, on a commercial scale whenever possible;
- (e) that in the education and training of forestry staff at the professional and technical levels, greater weight be given to the disciplines of administration, organization and especially sociology in its application to forestry work, and that training be more closely related to the occupational aspects;
- (f) that the countries promote studies and exchanges of information on the safety, hygiene and organization of forest work;
- (g) that the FAO/SIDA Seminar on the Development of Forestry Education, to be held in Quito in 1976, study how to connect the academic and occupational aspects in forestry training;
- (h) that FAO intensify its forestry education and training work, chiefly through the publication of practical manuals tailored to the needs of the region. In particular, FAO should publish a manual on the collection, compilation and use of statistical data of practical interest to forest administrations;
- (i) that interested countries and FAO promote research on Latin American moist tropical forests, creating a new research centre for Latin America and/or strengthening the existing ones and coordinating their work.

42. The Commission decided to record in the report of this Session its support for the "Comparative Study of Latin American Public Forestry Administrations" and its congratulations to the authors thereof.

